
X4
PN
X1
PG/OP
X2 PtP(MPI)
X3 MPI
CPU 015
PN
PLC
VIPA
PWR
TxD
Term
ERR
SD
RUN
STOP
MR
SPEED7

SLIO

System description SLIO

Structure and Concept

SLIO stands for Slice I/O. The system is very compact and can be adapted piecemeal exactly to the requirements of the application.

The system is designed for decentralized automation tasks.

With the help of the power module (PM), color contrasted from the signal modules (SM) and functional modules (FM), these are supplied with power and separate potential groups can be defined as required. The terminal module (TM) combines clamp, seating for the electronic module (EM) and mechanical bus connector. The electronic modules are connected to the terminal module in a secure sliding mechanism. In the case of service, only the electronic module is replaced by simply pulling out of the terminal module – wiring and mounting remain on the 35 mm profile rail. The step-formed spring-type terminals on the terminal module enable a quick, clear and secure wiring. Through integrated status LEDs and the label strip on the front a channel-specific, unambiguous allocation, and readability of the channel conditions of the electronic module is ensured.

All interface modules (IM) for PROFIBUS-DP, CANopen, PROFINET, EtherCAT, DeviceNet, Ethernet/IP and Modbus/TCP support up to 64 electronic modules.

The space-saving assembly size allows use in any automation environment.

Assembly is very easy: First the terminal modules are connected, then the electronic modules are inserted into the slot designated for the terminal module until the connection between both module parts is established by an audible click.

SLIO is one of the most highly efficient decentral systems worldwide and is evolving daily.

Performance and Application

SLIO is designed for large decentralized automation tasks in the manufacturing and process industries. SLIO expands key solutions and is integrated with the help of the device master files into existing fieldbus infrastructure. Through the new backplane bus concept the interface modules (fieldbus slave) in SLIO enable very short response times for signal processing.

Functions

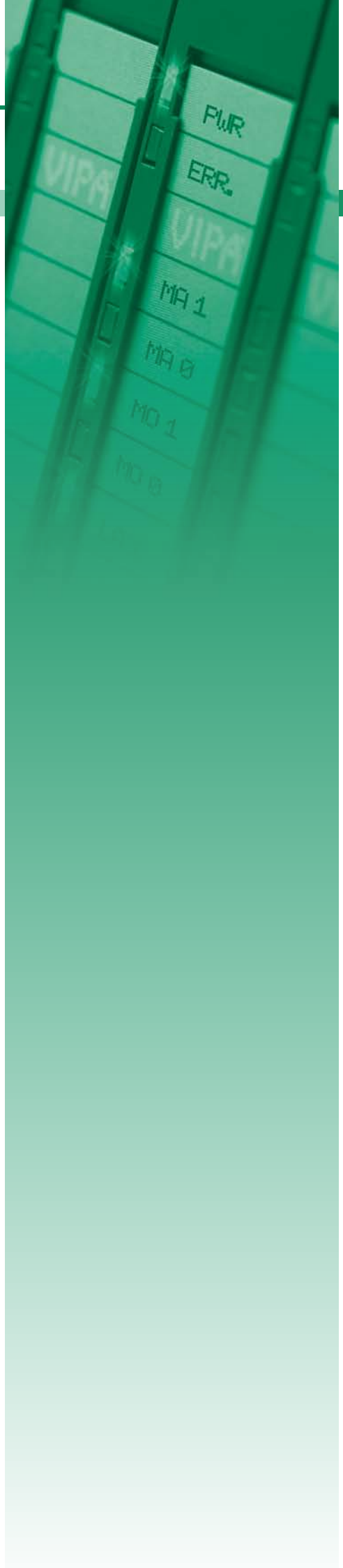
A variety of signal modules are available for the connection of sensors and actuators for acquiring digital and analog signals to and from the process.

For positioning, path measurement, counting tasks and other functions further functional modules are continuously being developed.

Communication

SLIO includes interface modules (fieldbus slave modules) with different fieldbus protocols by which the system, manufacturer-independent, can be integrated into most automation concepts.

Clamp modules



Assembly and function

Clamp modules are passive modules for 2- or 3-wire installations, whose contacts are vertical electrical connected internal. Within the module the backplane bus feed-through. The module does not have any module identification, but is considered at the maximum number of the modules.

Through the application of the clamp modules, distributors for power supply could be realized easily and enables so the connection of active supplied sensors like proximity switch. The wiring is done via timesaving and secure cage clamp technique.

The clamp modules are fixed on the mounting surface by means of a 35mm DIN rail.

Features

- Maintenance-free cage clamp technique
- Backplane bus feed-through
- Max. terminal voltage 10A
- Potential separation 500 Veff (field voltage to bus)
- Mounting on a 35mm DIN rail
- 24 month guarantee

Overview

Order no.	Name/Description	Page
Clamp modules		
001-1BA00	**CM 001 - Potential distributor module** › 8xDC 24 V clamps	**18**
001-1BA10	**CM 001 - Potential distributor module** › 8xDC 0 V clamps	**18**
001-1BA20	**CM 001 - Potential distributor module** › 4xDC 24 V, 4xDC 0 V clamps	**18**

Clamp modules

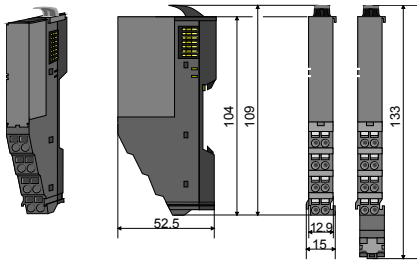
Clamp modules | Clamp modules						
001-1BA00 001-1BA10 001-1BA20						

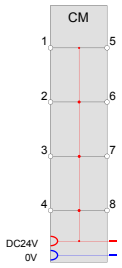
Order number	001-1BA00	001-1BA10	001-1BA20	
Figure				
Type	CM 001	CM 001	CM 001	
Module ID	-	-	-	
General information				
Note	-	-	-	
Features	› 8xDC 24 V clamps	› 8xDC 0 V clamps	› 4xDC 24 V, 4xDC 0 V clamps	
Clamp parameter				
Terminal voltage max.	DC 30 V	DC 0 V	DC 30 V	
Terminal current max.	10 A	10 A	10 A	
Total current per module, max.	10 A	10 A	10 A	
Isolated group				
Number of clamps	2*4	2*4	4-4	
Color of clamps	grey	grey	grey-grey	
Binding of potential	Field voltage DC 24V	Field voltage DC 0V	Field voltage DC 24V- Field voltage DC 0V	
Potential group current, max.	10 A	10 A	10 A-10 A	
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 52.5 mm	12.9 mm x 109 mm x 52.5 mm	12.9 mm x 109 mm x 52.5 mm	
Weight	50 g	50 g	50 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	yes	yes	yes	

Connections, Interfaces

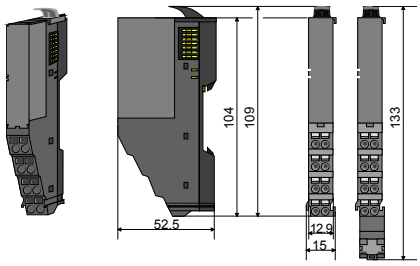
Clamp modules | Clamp modules						
001-1BA00 001-1BA10 001-1BA20						

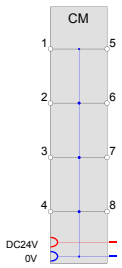
001-1BA00



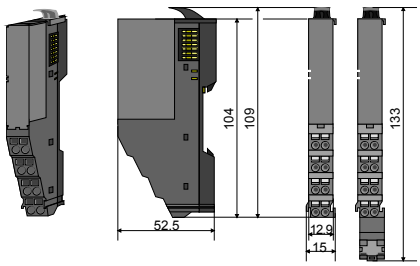


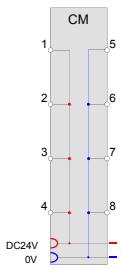
001-1BA10





001-1BA20





CPUs

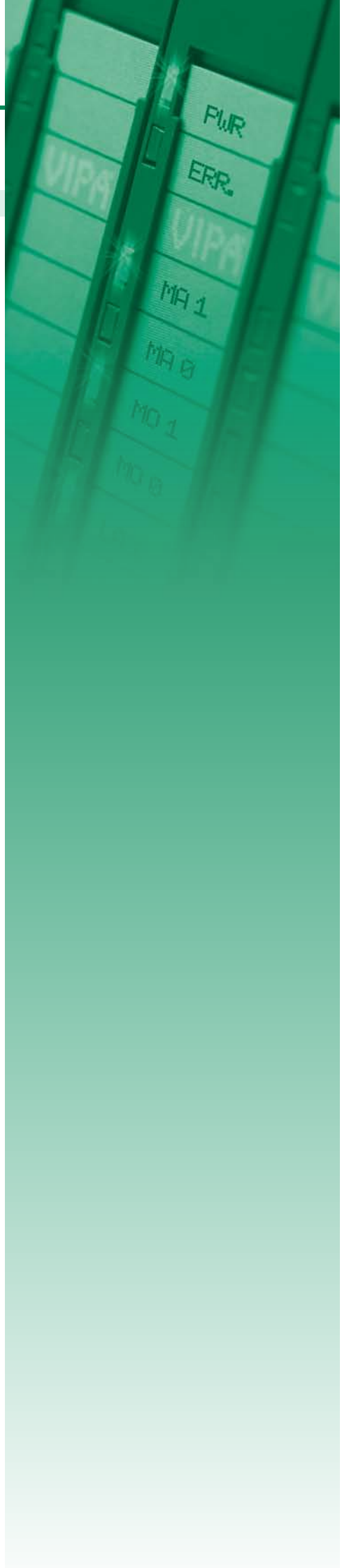
SLIO-CPU

Features known from the SPEED7 CPUs 300S Series have been integrated into the SLIO CPUs. Thus, memory management with flexible memory adaptation via the Memory Configuration Card (MCC), known from the SPEED7 CPUs of the 300 series, is present again in the SLIO CPUs, but has been updated. The VSC (VIPASetCard) now allows for two hardware variants to generate a total of 24 CPU variants. Even in its basic configuration, without the optional VSC, both hardware variants already provide so much memory, that many of the common applications can run immediately. With the help of the VSC, the memory can be expanded and the PROFIBUS communication can be enabled in both basic CPUs. Only the SD card has to be plugged into the CPU of the selected hardware variant. Then the additional features can be used immediately with the first operation. The VSC can also be used like any other standard SD card for storage of program and data. Programming is realized in the SIMATIC world, familiar to most users, i.e. concretely with STEP 7 or TIA Portal from Siemens.

Features of the SLIO CPU

- Integrated new SPEED7 7100DEV processor for outstanding performance
- Extremely fast backplane bus with 48Mbit/s
- Flexible memory expansion and extension of the communication possibilities without CPU-swap.
- Optional PROFIBUS Master or Slave which can be activated via VSC
- Second Ethernet interface with PROFINET-Controller integrated with the basic CPU 015
- Usable centralized and decentralized up to 64 modules – directly to the CPU
- Only two types of hardware for comprehensive savings in warehousing and logistic costs

Overview



Order no.	Name/Description	Page
CPUs STEP7 programmable, standard		
014-CEF0R00	**CPU 014 - SPEED7 technology** › SPEED7 technology › 64 kB work memory › Memory extension (max. 192 kB) via VIPASetCard › PROFIBUS slave/master activatable via VIPASetCard › Full-switchable serial interface integrated	**22**
CPUs STEP7 programmable, PROFINET		
015-CEFPR00	**CPU 015 - SPEED7 technology** › SPEED7 technology › 256 kB work memory › Memory extension (max. 512 kB) via VIPASetCard › PROFIBUS slave/master activatable via VIPASetCard › Full-switchable serial interface integrated › PROFINET controller for up to 128 participants integrated	**28**

CPUs STEP7 programmable, standard

CPUs | CPUs STEP7 programmable, standard						
014-CEF0R00						

Order number	014-CEF0R00			
Figure				
Type	CPU 014			
General information				
Note	-			
Features	› SPEED7 technology › 64 kB work memory › Memory extension (max. 192 kB) via VIPASetCard › PROFIBUS slave/ master activatable via VIPASetCard › Full-switchable serial interface integrated			
SPEED-Bus	-			
Technical data power supply				
Power supply (rated value)	DC 24 V			
Power supply (permitted range)	DC 20.4...28.8 V			
Reverse polarity protection	✓			
Current consumption (no-load operation)	120 mA			
Current consumption (rated value)	1 A			
Inrush current	3 A			
I^2t	0.1 A^2s			
Max. current drain at backplane bus	3 A			
Power loss	6 W			
Load and working memory				
Load memory, integrated	192 KB			
Load memory, maximum	192 KB			
Work memory, integrated	64 KB			
Work memory, maximal	192 KB			
Memory divided in 50% program / 50% data	✓			
Memory card slot	SD/MMC-Card with max. 2 GB			
Hardware configuration				
Racks, max.	1			
Modules per rack, max.	64			
Number of integrated DP master	1			
Number of DP master via CP	-			
Operable function modules	64			
Operable communication modules PtP	64			
Operable communication modules LAN	-			

CPUs | CPUs STEP7 programmable, standard						
014-CEF0R00						

Order number	014-CEF0R00			
Command processing times				
Bit instructions, min.	0.02 µs			
Word instruction, min.	0.02 µs			
Double integer arithmetic, min.	0.02 µs			
Floating-point arithmetic, min.	0.12 µs			
Timers/Counters and their retentive characteristics				
Number of S7 counters	512			
S7 counter remanence	adjustable 0 up to 512			
S7 counter remanence adjustable	C0 .. C7			
Number of S7 times	512			
S7 times remanence	adjustable 0 up to 512			
S7 times remanence adjustable	not retentive			
Data range and retentive characteristic				
Number of flags	8192 Byte			
Bit memories retentive characteristic adjustable	adjustable 0 up to 8192			
Bit memories retentive characteristic preset	MB0 .. MB15			
Number of data blocks	1024			
Max. data blocks size	64 KB			
Number range DBs	1 ... 8191			
Max. local data size per execution level	4096 Byte			
Max. local data size per block	4096 Byte			
Blocks				
Number of OBs	24			
Maximum OB size	64 KB			
Totalnumber DBs, FBs, FCs	1024			
Number of FBs	1024			
Maximum FB size	64 KB			
Number range FBs	0 ... 8191			
Number of FCs	1024			
Maximum FC size	64 KB			
Number range FC2	0 ... 8191			
Maximum nesting depth per priority class	16			
Maximum nesting depth additional within an error OB	4			
Time				
Real-time clock buffered	✓			
Clock buffered period (min.)	30 d			
Type ofbuffering	-			
Load time for 50% buffering period	15 min			
Load time for 100% buffering period	1 h			
Accuracy (max. deviation per day)	10 s			
Number of operating hours counter	8			
Clock synchronization	✓			
Synchronization via MPI	Master/Slave			
Synchronization via Ethernet (NTP)	no			

CPUs | CPUs STEP7 programmable, standard						
014-CEF0R00						

Order number	014-CEF0R00			
Address areas (I/O)				
Input I/O address area	2048 Byte			
Output I/O address area	2048 Byte			
Process image adjustable	✓			
Input process image preset	128 Byte			
Output process image preset	128 Byte			
Input process image maximal	2048 Byte			
Output process image maximal	2048 Byte			
Digital inputs	16384			
Digital outputs	16384			
Digital inputs central	512			
Digital outputs central	512			
Integrated digital inputs	-			
Integrated digital outputs	-			
Analog inputs	1024			
Analog outputs	1024			
Analog inputs, central	256			
Analog outputs, central	256			
Integrated analog inputs	-			
Integrated analog outputs	-			
Communication functions				
PG/OP channel	✓			
Global data communication	✓			
Number of GD circuits, max.	8			
Size of GD packets, max.	22 Byte			
S7 basic communication	✓			
S7 basic communication, user data per job	76 Byte			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			
S7 communication, user data per job	160 Byte			
Number of connections, max.	32			
Functionality Sub-D interfaces				
Type	X2			
Type of interface	RS485			
Connector	Sub-D, 9-pin, female			
Electrically isolated	✓			
MPI	✓			
MP²I (MPI/RS232)	-			
DP master	-			
DP slave	-			
Point-to-point interface	✓			

CPUs | CPUs STEP7 programmable, standard						
014-CEF0R00						

Order number	014-CEF0R00			
Type	X3			
Type of interface	RS485			
Connector	Sub-D, 9-pin, female			
Electrically isolated	✓			
MPI	✓			
MP²I (MPI/RS232)	-			
DP master	optional			
DP slave	optional			
Point-to-point interface	-			
Functionality MPI				
Number of connections, max.	32			
PG/OP channel	✓			
Routing	✓			
Global data communication	✓			
S7 basic communication	✓			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			
Transmission speed, min.	19.2 kbit/s			
Transmission speed, max.	12 Mbit/s			
Functionality PROFIBUS master				
PG/OP channel	✓			
Routing	✓			
S7 basic communication	✓			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			
Activation/deactivation of DP slaves	-			
Direct data exchange (slave-to-slave communication)	-			
DPV1	✓			
Transmission speed, min.	9.6 kbit/s			
Transmission speed, max.	12 Mbit/s			
Number of DP slaves, max.	124			
Address range inputs, max.	2 KB			
Address range outputs, max.	2 KB			
User data inputs per slave, max.	244 Byte			
User data outputs per slave, max.	244 Byte			
Functionality PROFIBUS slave				
PG/OP channel	✓			
Routing	✓			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			
Direct data exchange (slave-to-slave communication)	-			
DPV1	✓			

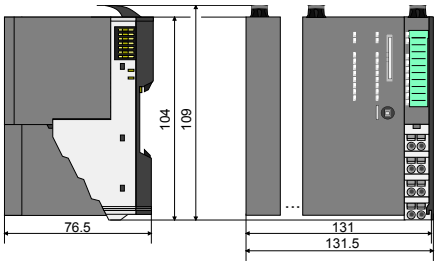
CPUs | CPUs STEP7 programmable, standard						
014-CEF0R00						

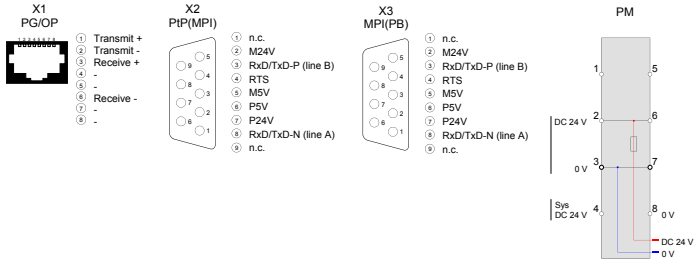
Order number	014-CEF0R00			
Transmission speed, min.	9.6 kbit/s			
Transmission speed, max.	12 Mbit/s			
Automatic detection of transmission speed	-			
Transfer memory inputs, max.	244 Byte			
Transfer memory outputs, max.	244 Byte			
Address areas, max.	32			
User data per address area, max.	32 Byte			
Point-to-point communication				
PtP communication	✓			
Interface isolated	✓			
RS232 interface	-			
RS422 interface	-			
RS485 interface	✓			
Connector	Sub-D, 9-pin, female			
Transmission speed, min.	150 bit/s			
Transmission speed, max.	115.5 kbit/s			
Cable length, max.	500 m			
Point-to-point protocol				
ASCII protocol	✓			
STX/ETX protocol	✓			
3964(R) protocol	✓			
RK512 protocol	-			
USS master protocol	✓			
Modbus master protocol	✓			
Modbus slave protocol	✓			
Special protocols	-			
Functionality RJ45 interfaces				
Type	X1			
Type of interface	Ethernet 10/100 MBit			
Connector	RJ45			
Electrically isolated	✓			
PG/OP channel	✓			
Number of connections, max.	4			
Productive connections	-			
Housing				
Material	PPE			
Mounting	Profile rail 35 mm			
Mechanical data				
Dimensions (WxHxD)	131.5 mm x 109 mm x 83 mm			
Weight	280 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	in preparation			

Connections, Interfaces

CPUs | CPUs STEP7 programmable, standard						
014-CEF0R00						

014-CEF0R00





CPUs STEP7 programmable, PROFINET

CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

Order number	015-CEFPR00			
Figure				
Type	SLIO CPU 015			
General information				
Note	-			
Features	› SPEED7 technology › 256 kB work memory › Memory extension (max. 512 kB) via VIPASetCard › PROFIBUS slave/ master activatable via VIPASetCard › Full-switchable serial interface integrated › PROFINET controller for up to 128 partici-pants integrated			
SPEED-Bus	-			
Technical data power supply				
Power supply (rated value)	DC 24 V			
Power supply (permitted range)	DC 20.4...28.8 V			
Reverse polarity protection	✓			
Current consumption (no-load operation)	150 mA			
Current consumption (rated value)	1.1 A			
Inrush current	3 A			
I^2t	0.1 A^2s			
Max. current drain at backplane bus	3 A			
Power loss	7.5 W			
Load and working memory				
Load memory, integrated	512 KB			
Load memory, maximum	512 KB			
Work memory, integrated	256 KB			
Work memory, maximal	512 KB			
Memory divided in 50% program / 50% data	✓			
Memory card slot	SD/MMC-Card with max. 2 GB			
Hardware configuration				
Racks, max.	1			
Modules per rack, max.	64			
Number of integrated DP master	1			
Number of DP master via CP	-			
Operable function modules	64			
Operable communication modules PtP	64			
Operable communication modules LAN	-			

CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

Order number	015-CEFPR00			
Command processing times				
Bit instructions, min.	0.01 µs			
Word instruction, min.	0.01 µs			
Double integer arithmetic, min.	0.01 µs			
Floating-point arithmetic, min.	0.06 µs			
Timers/Counters and their retentive characteristics				
Number of S7 counters	512			
S7 counter remanence	adjustable 0 up to 512			
S7 counter remanence adjustable	C0 .. C7			
Number of S7 times	512			
S7 times remanence	adjustable 0 up to 512			
S7 times remanence adjustable	not retentive			
Data range and retentive characteristic				
Number of flags	8192 Byte			
Bit memories retentive characteristic adjustable	adjustable 0 up to 8192			
Bit memories retentive characteristic preset	MB0 .. MB15			
Number of data blocks	4096			
Max. data blocks size	64 KB			
Number range DBs	1 ... 8191			
Max. local data size per execution level	4096 Byte			
Max. local data size per block	4096 Byte			
Blocks				
Number of OBs	24			
Maximum OB size	64 KB			
Totalnumber DBs, FBs, FCs	4096			
Number of FBs	4096			
Maximum FB size	64 KB			
Number range FBs	0 ... 8191			
Number of FCs	4096			
Maximum FC size	64 KB			
Number range FC2	0 ... 8191			
Maximum nesting depth per priority class	16			
Maximum nesting depth additional within an error OB	4			
Time				
Real-time clock buffered	✓			
Clock buffered period (min.)	30 d			
Type ofbuffering	-			
Load time for 50% buffering period	15 min			
Load time for 100% buffering period	1 h			
Accuracy (max. deviation per day)	10 s			
Number of operating hours counter	8			
Clock synchronization	✓			
Synchronization via MPI	Master/Slave			

CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

Order number	015-CEFPR00			
Synchronization via Ethernet (NTP)	Slave			
Address areas (I/O)				
Input I/O address area	2048 Byte			
Output I/O address area	2048 Byte			
Process image adjustable	✓			
Input process image preset	128 Byte			
Output process image preset	128 Byte			
Input process image maximal	2048 Byte			
Output process image maximal	2048 Byte			
Digital inputs	16384			
Digital outputs	16384			
Digital inputs central	512			
Digital outputs central	512			
Integrated digital inputs	-			
Integrated digital outputs	-			
Analog inputs	1024			
Analog outputs	1024			
Analog inputs, central	256			
Analog outputs, central	256			
Integrated analog inputs	-			
Integrated analog outputs	-			
Communication functions				
PG/OP channel	✓			
Global data communication	✓			
Number of GD circuits, max.	8			
Size of GD packets, max.	22 Byte			
S7 basic communication	✓			
S7 basic communication, user data per job	76 Byte			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			
S7 communication, user data per job	160 Byte			
Number of connections, max.	32			
Functionality Sub-D interfaces				
Type	X2			
Type of interface	RS485			
Connector	Sub-D, 9-pin, female			
Electrically isolated	✓			
MPI	✓			
MP²I (MPI/RS232)	-			
DP master	-			
DP slave	-			
Point-to-point interface	✓			

CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

Order number	015-CEFPR00			
Type	X3			
Type of interface	RS485			
Connector	Sub-D, 9-pin, female			
Electrically isolated	✓			
MPI	✓			
MP²I (MPI/RS232)	-			
DP master	optional			
DP slave	optional			
Point-to-point interface	-			
Functionality MPI				
Number of connections, max.	32			
PG/OP channel	✓			
Routing	✓			
Global data communication	✓			
S7 basic communication	✓			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			
Transmission speed, min.	19.2 kbit/s			
Transmission speed, max.	12 Mbit/s			
Functionality PROFIBUS master				
PG/OP channel	✓			
Routing	✓			
S7 basic communication	✓			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			
Activation/deactivation of DP slaves	-			
Direct data exchange (slave-to-slave communication)	-			
DPV1	✓			
Transmission speed, min.	9.6 kbit/s			
Transmission speed, max.	12 Mbit/s			
Number of DP slaves, max.	124			
Address range inputs, max.	2 KB			
Address range outputs, max.	2 KB			
User data inputs per slave, max.	244 Byte			
User data outputs per slave, max.	244 Byte			
Functionality PROFIBUS slave				
PG/OP channel	✓			
Routing	✓			
S7 communication	✓			
S7 communication as server	✓			
S7 communication as client	-			

CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

Order number	015-CEFPR00			
Direct data exchange (slave-to-slave communication)	-			
DPV1	✓			
Transmission speed, min.	9.6 kbit/s			
Transmission speed, max.	12 Mbit/s			
Automatic detection of transmission speed	-			
Transfer memory inputs, max.	244 Byte			
Transfer memory outputs, max.	244 Byte			
Address areas, max.	32			
User data per address area, max.	32 Byte			
Point-to-point communication				
PtP communication	✓			
Interface isolated	✓			
RS232 interface	-			
RS422 interface	-			
RS485 interface	✓			
Connector	Sub-D, 9-pin, female			
Transmission speed, min.	150 bit/s			
Transmission speed, max.	115.5 kbit/s			
Cable length, max.	500 m			
Point-to-point protocol				
ASCII protocol	✓			
STX/ETX protocol	✓			
3964(R) protocol	✓			
RK512 protocol	-			
USS master protocol	✓			
Modbus master protocol	✓			
Modbus slave protocol	✓			
Special protocols	-			
Functionality PROFINET I/O controller				
Realtime Class	-			
Conformance Class	PROFINET IO			
Number of PN IO devices	128			
IRT support	-			
Prioritized start-up	-			
Number of PN IO lines	1			
Address range inputs, max.	2 KB			
Address range outputs, max.	2 KB			
Transmiting clock	1 ms			
Update time	1 ms .. 512 ms			
Functionality RJ45 interfaces				
Type	X1			
Type of interface	Ethernet 10/100 MBit			
Connector	RJ45			
Electrically isolated	✓			
PG/OP channel	✓			

CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

Order number	015-CEFPR00			
Number of connections, max.	4			
Productive connections	-			
Type	X4			
Type of interface	Ethernet 10/100 MBit			
Connector	RJ45			
Electrically isolated	✓			
PG/OP channel	✓			
Number of connections, max.	8			
Productive connections	✓			
Ethernet communication CP				
Number of productive connections, max.	8			
Number of productive connections by Siemens NetPro, max.	8			
S7 connections	BSEND, BRCV, GET, PUT, Connection of active and passive data handling			
User data per S7 connection, max.	32 KB			
TCP-connections	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling			
User data per TCP connection, max.	64 KB			
ISO-connections	-			
User data per ISO connection, max.	-			
ISO on TCP connections (RFC 1006)	FETCH PASSIV, WRITE PASSIV, Connection of passive data handling			
User data per ISO on TCP connection, max.	32 KB			
UDP-connections	-			
User data per UDP connection, max.	-			
UDP-multicast-connections	-			
UDP-broadcast-connections	-			
Ethernet open communication				
Number of connections, max.	8			
User data per ISO on TCP connection, max.	8 KB			
User data per native TCP connection, max.	8 KB			
User data per ad hoc TCP connection, max.	1460 Byte			
User data per UDP connection, max.	1472 Byte			
Housing				
Material	PPE			
Mounting	Profile rail 35 mm			

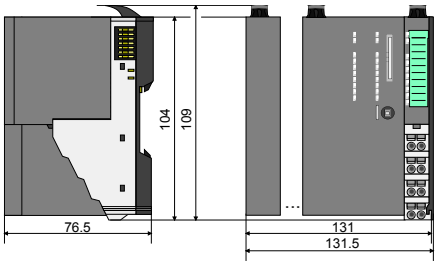
CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

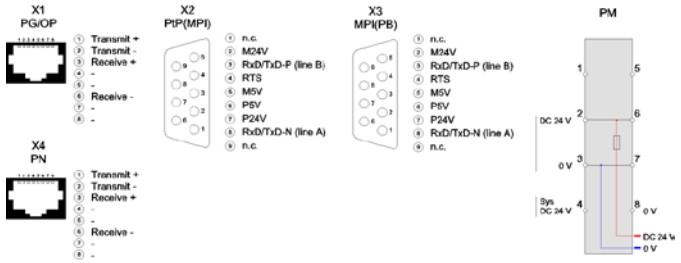
Order number	015-CEFPR00			
Mechanical data				
Dimensions (WxHxD)	131.5 mm x 109 mm x 83 mm			
Weight	310 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	in preparation			

Connections, Interfaces

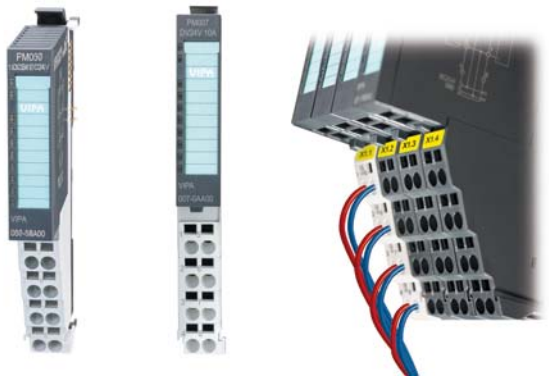
CPUs | CPUs STEP7 programmable, PROFINET						
015-CEFPR00						

015-CEFPR00





Power modules



Structure and Function

In the system SLIO the power supply is provided via power modules.

Both the bus interface as well as the electronics of the connected peripheral modules are supplied with power via the power module (PM) integrated in interface module (IM). The DC 24 V load power supply for the connected peripheral modules is provided via a further connection in the PM.

With the help of color-contrasted power modules within the system further potential areas for the DC 24 V load power supply can be defined.

The two-component design allows for the easiest of service by separating the electronics from the terminal module.

Characteristics

- Power supply of the sensor/actuator-level
- Nominal input voltage DC 24 V
- Output current max. 10 A
- Isolation from potential groups
- Front integrated status LEDs
- Mounting security by reverse polarity and overvoltage protection
- 24 months warranty

Overview

Order no.	Name/Description	Page
Power modules		
007-1AB00	**PM 007 - Power module** › Power supply DC 24 V, 10 A › Reverse polarity protection › Overvoltage protection	**38**
007-1AB10	**PM 007 - Power module** › Power supply DC 24 V, 4 A › Power supply DC 24 V for bus supply 5 V, 2 A › Reverse polarity protection › Overvoltage protection	**38**

Power modules

Power modules | Power modules						
007-1AB00 007-1AB10						

Order number	007-1AB00	007-1AB10		
Figure				
Type	PM 007	PM 007		
Module ID	-	-		
General information				
Note	-	-		
Features	› Power supply DC 24 V, 10 A › Reverse polarity protection › Overvoltage protection	› Power supply DC 24 V, 4 A › Power supply DC 24 V for bus supply 5 V, 2 A › Reverse polarity protection › Overvoltage protection		
Technical data power supply				
Input voltage (rated value)	DC 24 V	DC 24 V		
Input voltage (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V		
Mains frequency (rated value)	-	-		
Mains frequency (permitted range)	-	-		
Input current (at 120 V)	-	-		
Input current (at 230 V)	-	-		
Inrush current	-	-		
Power consumption	-	-		
Output voltage (rated value)	24 V	24 V		
Output current (rated value)	10 A	4 A		
Power supply parallel switchable	-	-		
Reverse polarity protection	yes	yes		
Overvoltage protection	36 V	36 V		
Ripple of output voltage (max.)	-	-		
Efficiency	-	89 %		
Power loss	-	1.4 W		
Status information, alarms, diagnostics				
Status display	yes	yes		
Interrupts	no	no		
Process alarm	no	no		
Diagnostic interrupt	no	no		
Diagnostic functions	no	no		
Diagnostics information read-out	none	none		
Supply voltage display	green LED	green LED		
Group error display	red LED	red LED		
Channel error display	none	none		

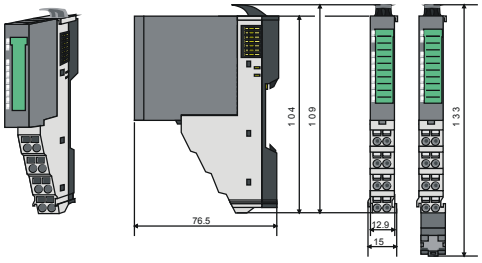
Power modules | Power modules						
007-1AB00 007-1AB10						

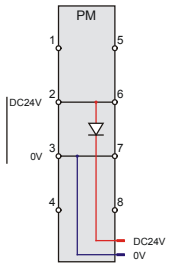
Order number	007-1AB00	007-1AB10		
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm		
Weight	60 g	75 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

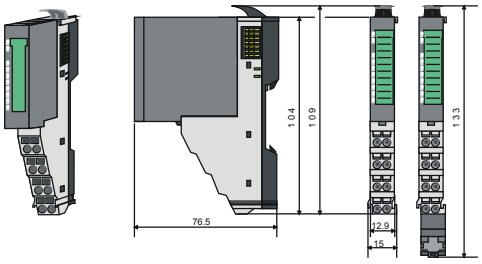
Power modules | Power modules						
007-1AB00 007-1AB10						

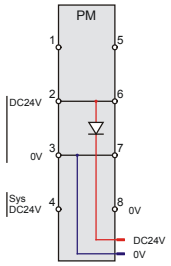
007-1AB00



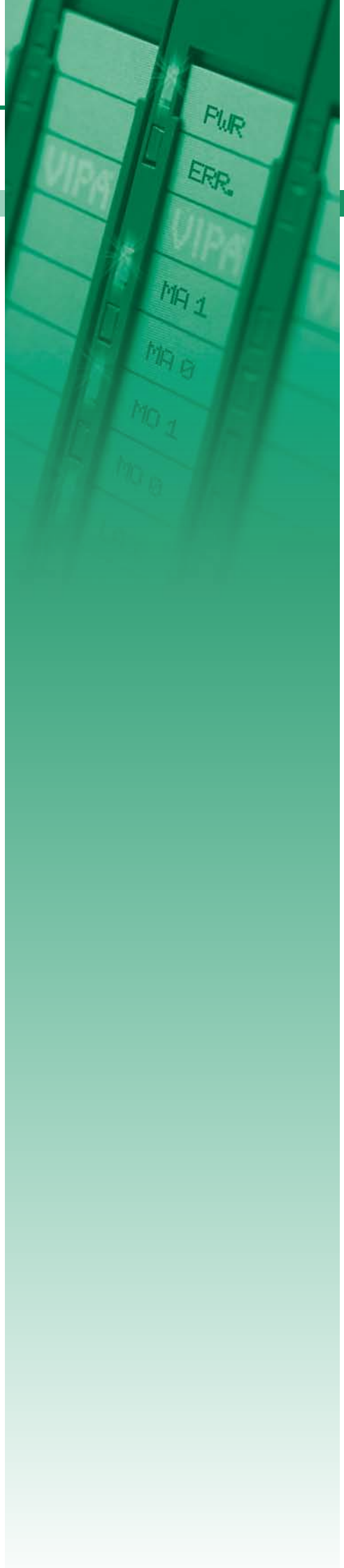


007-1AB10





Signal modules digital



Structure and Function

Signal modules (SM) to connect sensors and actuators are the interfaces of the system to the process. Digital signal modules acquire the binary control signals to and from the process level.

A variety of different digital signal modules provides exactly the I/O modules, which are required for each task. The digital modules differ in the number of channels, voltage and current ranges, isolation, and diagnostic and alarm capability.

Each signal module consists of a terminal and an electronic module.

The terminal module (TM) contains the receptacle for the electronic module (EM), the backplane connectors and contacts for the distribution of the load power supply electronics, the modular connection to DC 24 V load power supply and the staircase-shaped terminal block for wiring.

Furthermore the terminal module processes a locking system for fixing to a profile rail. The SLIO system can also be constructed "block by block" outside the cabinet and later assembled as a complete system in the control cabinet.

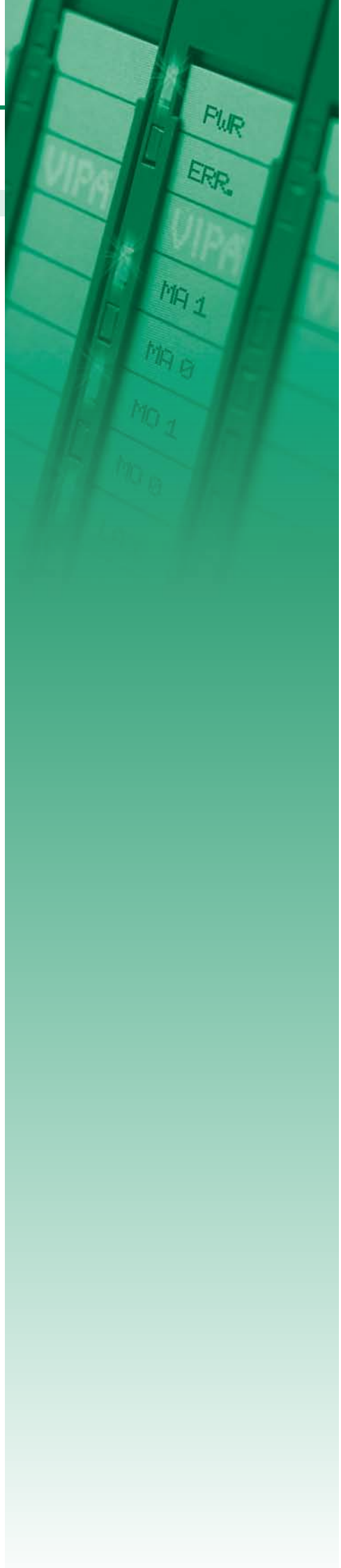
The functionality of the signal module is defined via the electronics module that is connected by a secure sliding mechanism to the terminal module.

During service the defective electronic module can be replaced without detaching the wiring.

Characteristics

- Electrically isolated digital inputs and outputs to the backplane bus
- 2, 4 or 8 channel
- Various modules, suitable for switches and proximity switches as well as for measuring transducers
- Direct mapping and readability of the channel conditions via status LEDs
- Safe and time-saving installation by the terminal assignment mounted on the module
- When changing the module equipment identification (BMK) is retained on the TM
- Individual single-channel lettering on insertion strip
- 24 month warranty

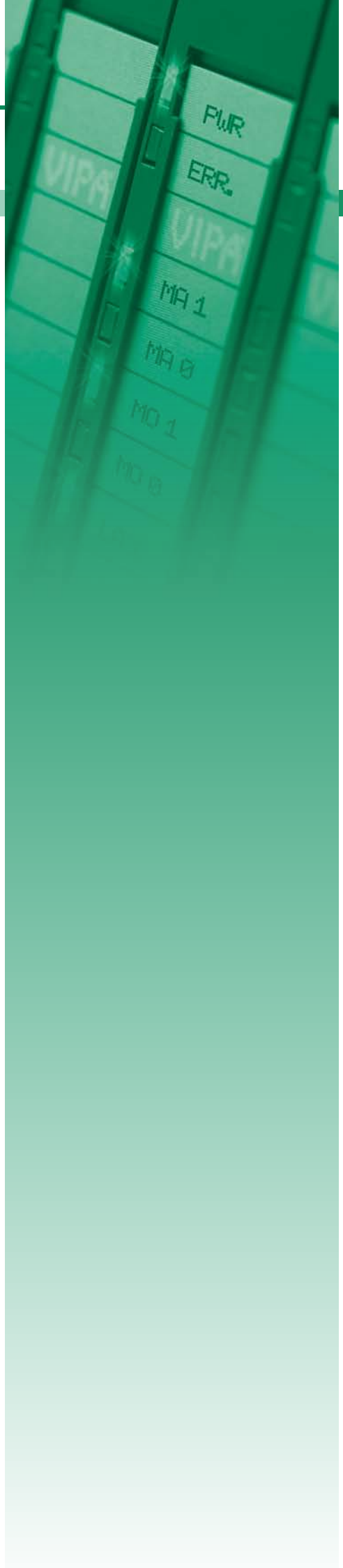
Overview



Order no.	Name/Description	Page
Digital input modules		
021-1BB00	**SM 021 - Digital input** › 2 inputs	**45**
021-1BB10	**SM 021 - Digital input** › 2 fast inputs › Input filter time delay parameterizable 2 µs...4 ms	**45**
021-1BB50	**SM 021 - Digital input** › 2 inputs › Active low input	**45**
021-1BB70	**SM 021 - Digital input** › 2 inputs › Time stamp	**45**
021-1BD00	**SM 021 - Digital input** › 4 inputs	**48**
021-1BD10	**SM 021 - Digital input** › 4 fast inputs › Input filter time delay parameterizable 2 µs...4 ms	**48**
021-1BD40	**SM 021 - Digital input** › 4 inputs › Connect 2/3-wire	**48**
021-1BD50	**SM 021 - Digital input** › 4 inputs › Active low input	**48**
021-1BD70	**SM 021 - Digital input** › 4 inputs › Time stamp	**51**
021-1BF00	**SM 021 - Digital input** › 8 inputs	**51**
021-1BF50	**SM 021 - Digital input** › 8 inputs › Active low input	**51**
021-1DF00	**SM 021 - Digital input** › 8 inputs › diagnosis of wiring errors	**51**
021-1SD00	**SM 021 - Digital input** › 4 inputs › Safety	**54**
Digital output modules		
022-1BB00	**SM 022 - Digital output** › 2 outputs › Output current 0.5 A	**57**
022-1BB20	**SM 022 - Digital output** › 2 outputs › Output current 2 A	**57**
022-1BB50	**SM 022 - Digital output** › 2 Low-Side outputs › Output current 0.5 A	**57**
022-1BB70	**SM 022 - Digital output** › 2 outputs › Time stamp › Output current 0.5 A	**57**
022-1BB90	**SM 022 - Digital output** › 2 outputs › PWM	**61**
022-1BD00	**SM 022 - Digital output** › 4 outputs › Output current 0.5 A	**61**
022-1BD20	**SM 022 - Digital output** › 4 outputs › Output current 2 A	**61**
022-1BD50	**SM 022 - Digital output** › 4 Low-Side outputs › Output current 0.5 A	**61**
022-1BD70	**SM 022 - Digital output** › 4 outputs › Time stamp › Output current 0.5 A	**65**

Overview

Order no.	Name/Description	Page
022-1BF00	**SM 022 - Digital output** › 8 outputs › Output current 0.5 A	**65**
022-1BF50	**SM 022 - Digital output** › 8 Low-Side outputs › Output current 0.5 A	**65**
022-1HB10	**SM 022 - Digital output** › 2 relay outputs › DC 30 V/ AC 230 V › Output current 3 A	**65**
022-1DF00	**SM 022 - Digital output** › 8 outputs › Output current 0.5 A › diagnosis of wiríng errors	**69**
022-1SD00	**SM 022 - Digital output** › 4 outputs › Safety › Output current 0.5 A	**69**



Digital input modules

Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

Order number	021-1BB00	021-1BB10	021-1BB50	021-1BB70
Figure				
Type	SM 021	SM 021	SM 021	SM 021
Module ID	0001 9F82	000A 1F02	0002 9F82	0F01 47C1
General information				
Note	-	-	-	-
Features	› 2 inputs	› 2 fast inputs › Input filter time delay parameterizable 2 µs...4 ms	› 2 inputs › Active low input	› 2 inputs › Time stamp
Current consumption/power loss				
Current consumption from backplane bus	55 mA	95 mA	60 mA	85 mA
Power loss	0.5 W	0.9 W	0.5 W	0.9 W
Technical data digital inputs				
Number of inputs	2	2	2	2
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	-	DC 20.4...28.8 V	-	DC 24 V
Current consumption from load voltage L+ (without load)	-	12 mA	-	10 mA
Rated value	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Input voltage for signal "0"	DC 0...5 V	DC 0...5 V	DC 15...28.8 V	DC 0...5 V
Input voltage for signal "1"	DC 15...28.8 V	DC 15...28.8 V	DC 0...5 V	DC 15...28.8 V
Input voltage hysteresis	-	-	-	-
Frequency range	-	-	-	-
Input resistance	-	-	-	-
Input current for signal "1"	3 mA	3 mA	3 mA	3 mA
Connection of Two-Wire-BEROs possible	✓	✓	✓	✓
Max. permissible BERO quiescent current	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Input delay of "0" to "1"	3 ms	parameterizable 2µs - 3ms	3 ms	parameterizable 2µs - 3ms
Input delay of "1" to "0"	3 ms	parameterizable 2µs - 3ms	3 ms	parameterizable 2µs - 3ms
Number of simultaneously utilizable inputs horizontal configuration	2	2	2	2
Number of simultaneously utilizable inputs vertical configuration	2	2	2	2
Input characteristic curve	IEC 61131-2, type 1	IEC 61131-2, type 1	-	IEC 61131-2, type 1
Initial data size	2 Bit	2 Bit	2 Bit	60 Byte

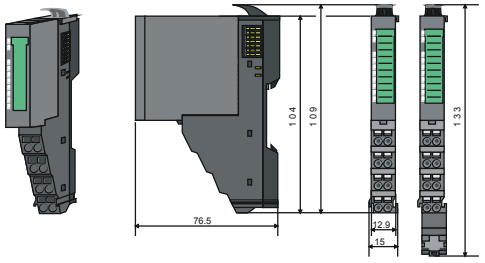
Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

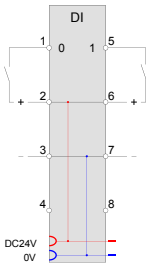
Order number	021-1BB00	021-1BB10	021-1BB50	021-1BB70
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	yes, parameterizable	no	no
Process alarm	no	yes, parameterizable	no	no
Diagnostic interrupt	no	yes, parameterizable	no	no
Diagnostic functions	no	yes	no	no
Diagnostics information read-out	none	possible	none	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Safety				
Safety protocol	-	-	-	-
Safety requirements	-	-	-	-
Secure user address	-	-	-	-
Watchdog	-	-	-	-
Two channels	-	-	-	-
Test pulse outputs	-	-	-	-
Datasizes				
Input bytes	1	1	1	20 / 60
Output bytes	0	0	0	0
Parameter bytes	0	9	0	10
Diagnostic bytes	0	20	0	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

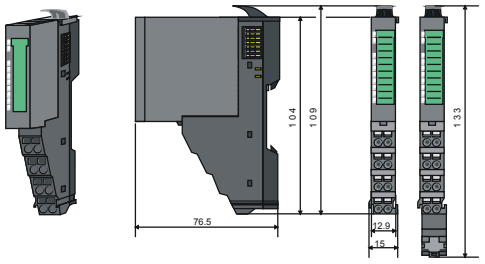
Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

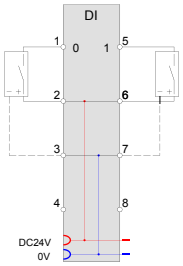
021-1BB00



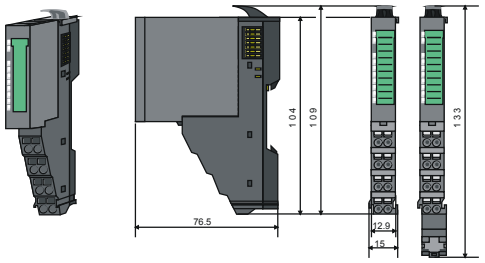


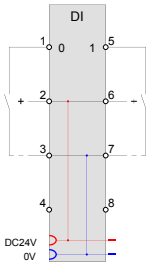
021-1BB10



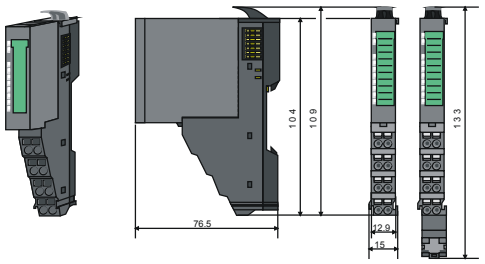


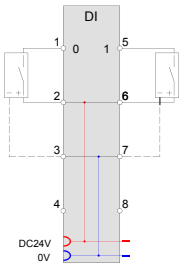
021-1BB50





021-1BB70





Digital input modules

Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

Order number	021-1BD00	021-1BD10	021-1BD40	021-1BD50
Figure				
Type	SM 021	SM 021	SM 021	SM 021
Module ID	0003 9F84	0009 1F04	0008 9F84	0004 9F84
General information				
Note	-	-	-	-
Features	› 4 inputs	› 4 fast inputs › Input filter time delay parameterizable 2 µs...4 ms	› 4 inputs › Connect 2/3-wire	› 4 inputs › Active low input
Current consumption/power loss				
Current consumption from backplane bus	55 mA	95 mA	55 mA	65 mA
Power loss	0.6 W	0.95 W	0.6 W	0.6 W
Technical data digital inputs				
Number of inputs	4	4	4	4
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	-	DC 20.4...28.8 V	-	-
Current consumption from load voltage L+ (without load)	-	15 mA	-	-
Rated value	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Input voltage for signal "0"	DC 0...5 V	DC 0...5 V	DC 0...5 V	DC 15...28.8 V
Input voltage for signal "1"	DC 15...28.8 V	DC 15...28.8 V	DC 15...28.8 V	DC 0...5 V
Input voltage hysteresis	-	-	-	-
Frequency range	-	-	-	-
Input resistance	-	-	-	-
Input current for signal "1"	3 mA	3 mA	3 mA	3 mA
Connection of Two-Wire-BEROs possible	✓	✓	✓	✓
Max. permissible BERO quiescent current	0.5 mA	0.5 mA	0.5 mA	0.5 mA
Input delay of "0" to "1"	3 ms	parameterizable 2µs - 3ms	3 ms	3 ms
Input delay of "1" to "0"	3 ms	parameterizable 2µs - 3ms	3 ms	3 ms
Number of simultaneously utilizable inputs horizontal configuration	4	4	4	4
Number of simultaneously utilizable inputs vertical configuration	4	4	4	4
Input characteristic curve	IEC 61131-2, type 1	IEC 61131-2, type 1	IEC 61131-2, type 1	-
Initial data size	4 Bit	4 Bit	4 Bit	4 Bit

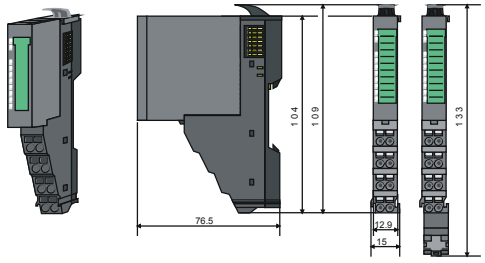
Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

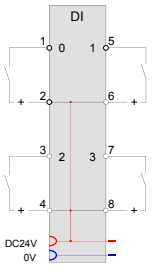
Order number	021-1BD00	021-1BD10	021-1BD40	021-1BD50
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	yes, parameterizable	no	no
Process alarm	no	yes, parameterizable	no	no
Diagnostic interrupt	no	yes, parameterizable	no	no
Diagnostic functions	no	yes	no	no
Diagnostics information read-out	none	possible	none	none
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Safety				
Safety protocol	-	-	-	-
Safety requirements	-	-	-	-
Secure user address	-	-	-	-
Watchdog	-	-	-	-
Two channels	-	-	-	-
Test pulse outputs	-	-	-	-
Datasizes				
Input bytes	1	1	1	1
Output bytes	0	0	0	0
Parameter bytes	0	11	0	0
Diagnostic bytes	0	20	0	0
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

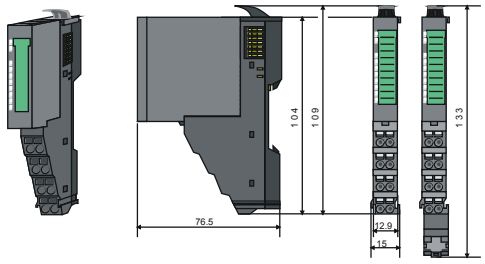
Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

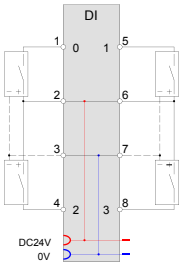
021-1BD00



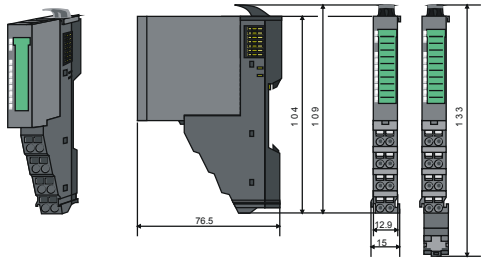


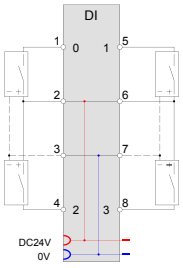
021-1BD10



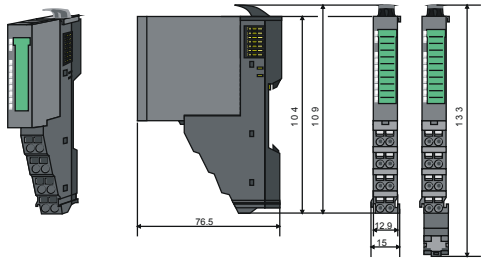


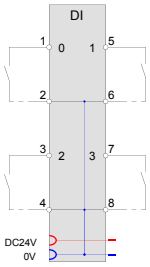
021-1BD40





021-1BD50





Digital input modules

Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

Order number	021-1BD70	021-1BF00	021-1BF50	021-1DF00
Figure				
Type	SM 021	SM 021	SM 021	SM 021
Module ID	0F03 47C2	0005 9FC1	0007 9FC1	0012 1F41
General information				
Note	-	-	-	-
Features	› 4 inputs › Time stamp	› 8 inputs	› 8 inputs › Active low input	› 8 inputs › diagnosis of wiring errors
Current consumption/power loss				
Current consumption from backplane bus	85 mA	60 mA	65 mA	60 mA
Power loss	0.95 W	0.9 W	0.9 W	1.1 W
Technical data digital inputs				
Number of inputs	4	8	8	8
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	DC 24 V	-	-	-
Current consumption from load voltage L+ (without load)	15 mA	-	-	-
Rated value	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Input voltage for signal "0"	DC 0...5 V	DC 0...5 V	DC 15...28.8 V	DC 0...5 V
Input voltage for signal "1"	DC 15...28.8 V	DC 15...28.8 V	DC 0...5 V	DC 10,8...28,8 V
Input voltage hysteresis	-	-	-	-
Frequency range	-	-	-	-
Input resistance	-	-	-	-
Input current for signal "1"	3 mA	3 mA	3 mA	3 mA
Connection of Two-Wire-BEROs possible	✓	✓	✓	✓
Max. permissible BERO quiescent current	0.5 mA	0.5 mA	0.5 mA	1.5 mA
Input delay of "0" to "1"	parameterizable 2µs - 3ms	3 ms	3 ms	parameterizable 100µs - 20ms
Input delay of "1" to "0"	parameterizable 2µs - 3ms	3 ms	3 ms	parameterizable 100µs - 20ms
Number of simultaneously utilizable inputs horizontal configuration	4	8	8	8
Number of simultaneously utilizable inputs vertical configuration	4	8	8	8
Input characteristic curve	IEC 61131-2, type 1	IEC 61131-2, type 1	-	IEC 61131-2, type 3
Initial data size	60 Byte	8 Bit	8 Bit	8 Bit

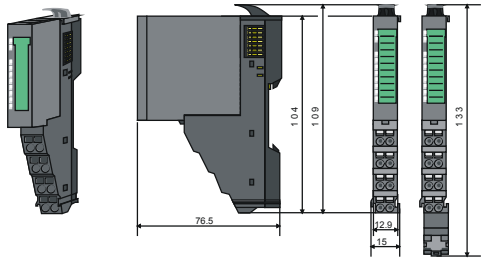
Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

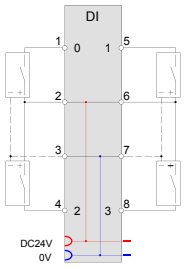
Order number	021-1BD70	021-1BF00	021-1BF50	021-1DF00
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	no	no	yes
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	yes, parameterizable
Diagnostic functions	no	no	no	yes
Diagnostics information read-out	possible	none	none	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Safety				
Safety protocol	-	-	-	-
Safety requirements	-	-	-	-
Secure user address	-	-	-	-
Watchdog	-	-	-	-
Two channels	-	-	-	-
Test pulse outputs	-	-	-	-
Datasizes				
Input bytes	20 / 60	1	1	1
Output bytes	0	0	0	0
Parameter bytes	12	0	0	12
Diagnostic bytes	20	0	0	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	in preparation

Connections, Interfaces

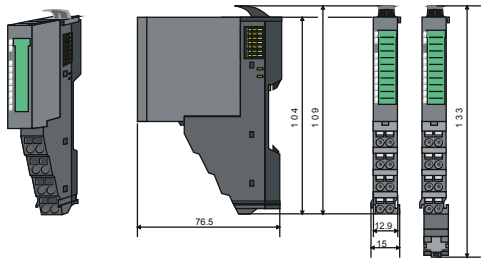
Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

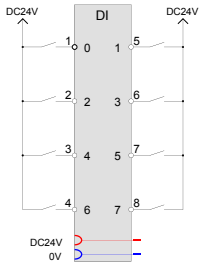
021-1BD70



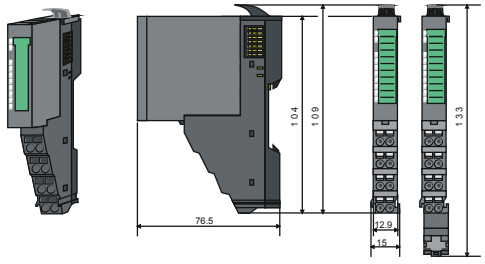


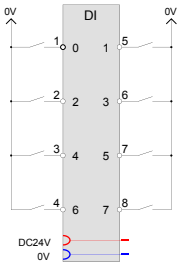
021-1BF00



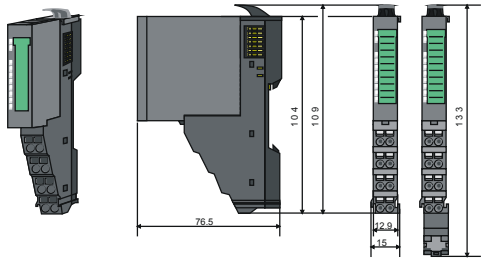


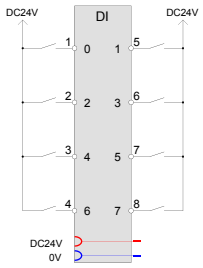
021-1BF50





021-1DF00





Digital input modules

Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

Order number	021-1SD00			
Figure				
Type	SM 021			
Module ID	0C41 2E00			
General information				
Note	-			
Features	› 4 inputs › Safety			
Current consumption/power loss				
Current consumption from backplane bus	95 mA			
Power loss	0.8 W			
Technical data digital inputs				
Number of inputs	4			
Cable length, shielded	330 m			
Cable length, unshielded	330 m			
Rated load voltage	-			
Current consumption from load voltage L+ (without load)	2 mA			
Rated value	DC 20.4...28.8 V			
Input voltage for signal "0"	DC 0...5 V			
Input voltage for signal "1"	DC 11...28.8 V			
Input voltage hysteresis	-			
Frequency range	-			
Input resistance	-			
Input current for signal "1"	3 mA			
Connection of Two-Wire-BEROs possible	✓			
Max. permissible BERO quiescent current	1.5 mA			
Input delay of "0" to "1"	parameterizable 1ms - 1s			
Input delay of "1" to "0"	parameterizable 1ms - 1s			
Number of simultaneously utilizable inputs horizontal configuration	4			
Number of simultaneously utilizable inputs vertical configuration	4			
Input characteristic curve	IEC 61131-2, type 3			
Initial data size	4 Bit			

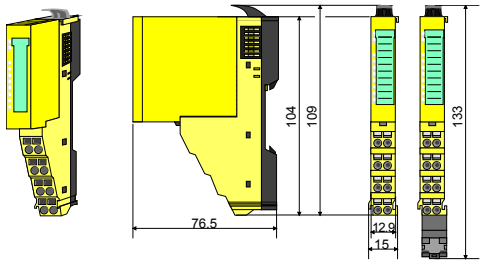
Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

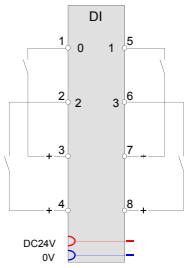
Order number	021-1SD00			
Status information, alarms, diagnostics				
Status display	green LED per channel			
Interrupts	yes, parameterizable			
Process alarm	no			
Diagnostic interrupt	yes, parameterizable			
Diagnostic functions	yes, parameterizable			
Diagnostics information read-out	possible			
Module state	green LED			
Module error display	red LED			
Channel error display	red ERR-LED and yellow ER2-LED			
Isolation				
Between channels	-			
Between channels of groups to	-			
Between channels and backplane bus	✓			
Insulation tested with	DC 500 V			
Safety				
Safety protocol	PROFIsafe V2			
Safety requirements	SIL CL 3, PL e, Kat 4			
Secure user address	1 - 4095			
Watchdog	parameterizable 10ms - 1s			
Two channels	Each 2 of 4 inputs switchable			
Test pulse outputs	4			
Datasizes				
Input bytes	5			
Output bytes	5			
Parameter bytes	44			
Diagnostic bytes	20			
Housing				
Material	PC / PPE GF10			
Mounting	Profile rail 35 mm			
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm			
Weight	60 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	in preparation			

Connections, Interfaces

Signal modules digital | Digital input modules						
021-1BB00 021-1BB10 021-1BB50 021-1BB70	021-1BD00 021-1BD10 021-1BD40 021-1BD50	021-1BD70 021-1BF00 021-1BF50 021-1DF00	021-1SD00			

021-1SD00





Digital output modules

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1BB00	022-1BB20	022-1BB50	022-1BB70
Figure				
Type	SM 022	SM 022	SM 022	SM 022
Module ID	0101 AF90	0102 AF90	0103 AF90	0F41 57E1
General information				
Note	-	-	-	-
Features	› 2 outputs › Output current 0.5 A	› 2 outputs › Output current 2 A	› 2 Low-Side outputs › Output current 0.5 A	› 2 outputs › Time stamp › Output current 0.5 A
Current consumption/power loss				
Current consumption from backplane bus	55 mA	60 mA	60 mA	85 mA
Power loss	0.4 W	0.55 W	0.4 W	0.95 W
Technical data digital outputs				
Number of outputs	2	2	2	2
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Current consumption from load voltage L+ (without load)	5 mA	10 mA	2.5 mA	15 mA
Total current per group, horizontal configuration, 40°C	1 A	4 A	1 A	1 A
Total current per group, horizontal configuration, 60°C	1 A	4 A	1 A	1 A
Total current per group, vertical configuration	1 A	4 A	1 A	1 A
Output current at signal "1", rated value	0.5 A	2 A	0.5 A	0.5 A
Output delay of "0" to "1"	30 µs	100 µs	30 µs	max. 100 ns
Output delay of "1" to "0"	175 µs	250 µs	100 µs	max. 100 ns
Minimum load current	-	-	-	-
Lamp load	10 W	10 W	10 W	10 W
Parallel switching of outputs for redundant control of a load	not possible	not possible	not possible	not possible
Parallel switching of outputs for increased power	not possible	not possible	not possible	not possible
Actuation of digital input	✓	✓	✓	✓
Switching frequency with resistive load	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz	max. 40 kHz
Switching frequency with inductive load	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz	max. 40 kHz
Switching frequency on lamp load	max. 10 Hz	max. 10 Hz	max. 10 Hz	max. 40 kHz
Internal limitation of inductive shut-off voltage	L+ (-45 V)	L+ (-52 V)	+45 V	L+ (-52 V)
Short-circuit protection of output	yes, electronic	yes, electronic	yes, electronic	yes, electronic, and only highside
Trigger level	1 A	2.7 A	1.7 A	2.5 A
Number of operating cycle of relay outputs	-	-	-	-

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1BB00	022-1BB20	022-1BB50	022-1BB70
Switching capacity of contacts	-	-	-	-
Output data size	2 Bit	2 Bit	2 Bit	60 Byte
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	none	none	none	possible
Supply voltage display	green LED	green LED	green LED	green LED
Group error display	red LED	red LED	red LED	red LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
PWM data				
PWM channels	-	-	-	-
PWM time basis	-	-	-	-
Period length	-	-	-	-
Minimum pulse width	-	-	-	-
PtP communication	-	-	-	-
Safety				
Safety protocol	-	-	-	-
Safety requirements	-	-	-	-
Secure user address	-	-	-	-
Watchdog	-	-	-	-
Two channels	-	-	-	-
Test pulse length	-	-	-	-
Circuit monitoring	-	-	-	-
Datasizes				
Input bytes	0	0	0	4
Output bytes	1	1	1	20 / 60
Parameter bytes	0	0	0	6
Diagnostic bytes	0	0	0	20

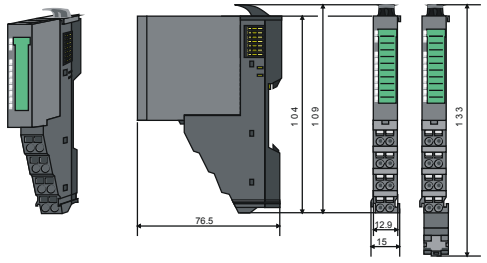
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

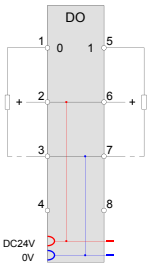
Order number	022-1BB00	022-1BB20	022-1BB50	022-1BB70
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

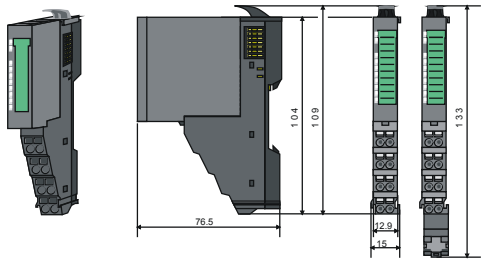
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

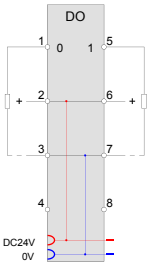
022-1BB00



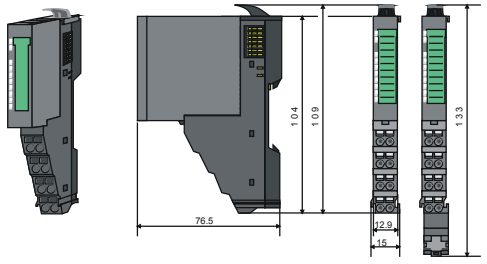


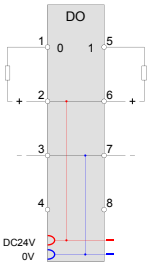
022-1BB20





022-1BB50





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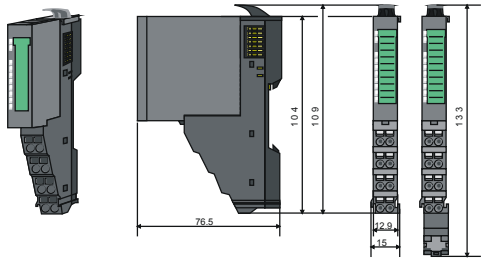
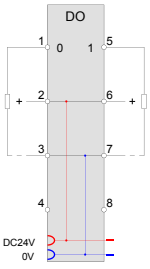




Digital output modules

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1BB90	022-1BD00	022-1BD20	022-1BD50
Figure				
Type	SM 022	SM 022	SM 022	SM 022
Module ID	0901 4880	0104 AFA0	0108 AFA0	0105 AFA0
General information				
Note	-	-	-	-
Features	› 2 outputs › PWM	› 4 outputs › Output current 0.5 A	› 4 outputs › Output current 2 A	› 4 Low-Side outputs › Output current 0.5 A
Current consumption/power loss				
Current consumption from backplane bus	85 mA	55 mA	65 mA	65 mA
Power loss	0.95 W	0.5 W	0.8 W	0.5 W
Technical data digital outputs				
Number of outputs	2	4	4	4
Cable length, shielded	1000 m	1000 m	1000 m	1000 m
Cable length, unshielded	600 m	600 m	600 m	600 m
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Current consumption from load voltage L+ (without load)	15 mA	10 mA	20 mA	5 mA
Total current per group, horizontal configuration, 40°C	1 A	2 A	4 A	2 A
Total current per group, horizontal configuration, 60°C	1 A	2 A	4 A	2 A
Total current per group, vertical configuration	1 A	2 A	4 A	2 A
Output current at signal "1", rated value	0.5 A	0.5 A	2 A	0.5 A
Output delay of "0" to "1"	max. 100 ns	30 µs	100 µs	30 µs
Output delay of "1" to "0"	max. 100 ns	175 µs	250 µs	100 µs
Minimum load current	-	-	-	-
Lamp load	10 W	10 W	10 W	10 W
Parallel switching of outputs for redundant control of a load	not possible	not possible	not possible	not possible
Parallel switching of outputs for increased power	not possible	not possible	not possible	not possible
Actuation of digital input	✓	✓	✓	✓
Switching frequency with resistive load	max. 40 kHz	max. 1000 Hz	max. 1000 Hz	max. 1000 Hz
Switching frequency with inductive load	max. 40 kHz	max. 0.5 Hz	max. 0.5 Hz	max. 0.5 Hz
Switching frequency on lamp load	max. 40 kHz	max. 10 Hz	max. 10 Hz	max. 10 Hz
Internal limitation of inductive shut-off voltage	L+ (-52 V)	L+ (-45 V)	L+ (-52 V)	+45 V
Short-circuit protection of output	yes, electronic, and only highside	yes, electronic	yes, electronic	yes, electronic
Trigger level	2.5 A	1 A	2.7 A	1.7 A
Number of operating cycle of relay outputs	-	-	-	-
Switching capacity of contacts	-	-	-	-

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1BB90	022-1BD00	022-1BD20	022-1BD50
Output data size	12 Byte	4 Bit	4 Bit	4 Bit
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	green LED per channel	green LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	possible	none	none	none
Supply voltage display	green LED	green LED	green LED	green LED
Group error display	red LED	red SF LED	red SF LED	red SF LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
PWM data				
PWM channels	2	-	-	-
PWM time basis	-	-	-	-
Period length	-	-	-	-
Minimum pulse width	1 µs	-	-	-
PtP communication	-	-	-	-
Safety				
Safety protocol	-	-	-	-
Safety requirements	-	-	-	-
Secure user address	-	-	-	-
Watchdog	-	-	-	-
Two channels	-	-	-	-
Test pulse length	-	-	-	-
Circuit monitoring	-	-	-	-
Datasizes				
Input bytes	4	0	0	0
Output bytes	12	1	1	1
Parameter bytes	12	0	0	0
Diagnostic bytes	20	0	0	0

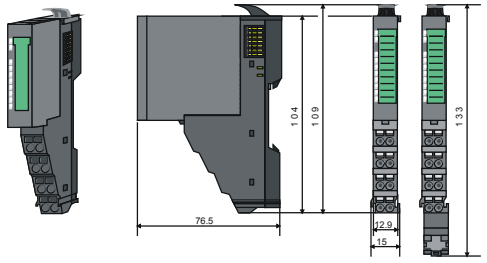
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

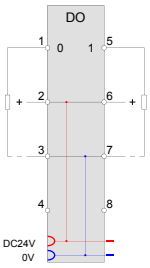
Order number	022-1BB90	022-1BD00	022-1BD20	022-1BD50
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

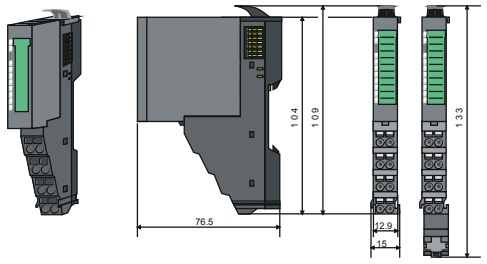
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

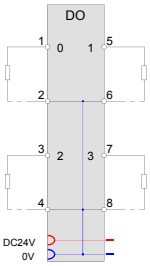
022-1BB90



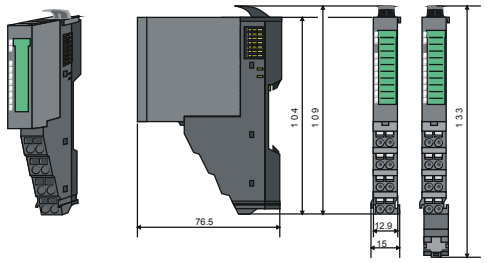


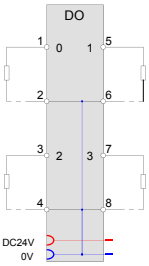
022-1BD00



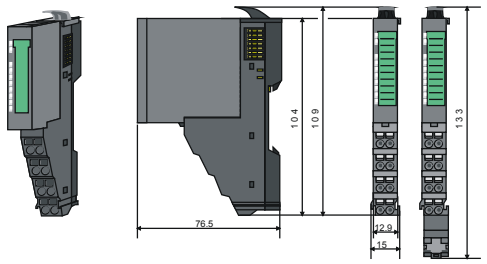


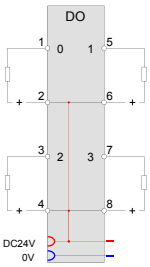
022-1BD20





022-1BD50





Digital output modules

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1BD70	022-1BF00	022-1BF50	022-1HB10
Figure				
Type	SM 022	SM 022	SM 022	SM 022
Module ID	0F43 57E2	0106 AFC8	0107 AFC8	0109 AF90
General information				
Note	-	-	-	-
Features	› 4 outputs › Time stamp › Output current 0.5 A	› 8 outputs › Output current 0.5 A	› 8 Low-Side outputs › Output current 0.5 A	› 2 relay outputs › DC 30 V/ AC 230 V › Output current 3 A
Current consumption/power loss				
Current consumption from backplane bus	90 mA	65 mA	70 mA	130 mA
Power loss	0.95 W	0.7 W	0.6 W	0.7 W
Technical data digital outputs				
Number of outputs	4	8	8	2
Cable length, shielded	1000 m	1000 m	1000 m	-
Cable length, unshielded	600 m	600 m	600 m	-
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 30 V/ AC 230 V
Current consumption from load voltage L+ (without load)	25 mA	15 mA	10 mA	-
Total current per group, horizontal configuration, 40°C	2 A	4 A	2.5 A	-
Total current per group, horizontal configuration, 60°C	2 A	4 A	2.5 A	-
Total current per group, vertical configuration	2 A	4 A	2.5 A	-
Output current at signal "1", rated value	0.5 A	0.5 A	0.5 A	3 A
Output delay of "0" to "1"	max. 100 ns	30 µs	30 µs	6 ms
Output delay of "1" to "0"	max. 100 ns	175 µs	100 µs	3 ms
Minimum load current	-	-	-	-
Lamp load	10 W	10 W	10 W	-
Parallel switching of outputs for redundant control of a load	not possible	not possible	not possible	-
Parallel switching of outputs for increased power	not possible	not possible	not possible	-
Actuation of digital input	✓	✓	✓	-
Switching frequency with resistive load	max. 40 kHz	max. 1000 Hz	max. 1000 Hz	max. 100 Hz
Switching frequency with inductive load	max. 40 kHz	max. 0.5 Hz	max. 0.5 Hz	-
Switching frequency on lamp load	max. 40 kHz	max. 10 Hz	max. 10 Hz	-
Internal limitation of inductive shut-off voltage	L+ (-52 V)	L+ (-45 V)	+45 V	-
Short-circuit protection of output	yes, electronic, and only highside	yes, electronic	yes, electronic	-
Trigger level	2.5 A	1 A	1.7 A	-
Number of operating cycle of relay outputs	-	-	-	-

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1BD70	022-1BF00	022-1BF50	022-1HB10
Switching capacity of contacts	-	-	-	3 A
Output data size	60 Byte	8 Bit	8 Bit	2 Bit
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel	red LED per channel	red LED per channel
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	no	no	no	no
Diagnostics information read-out	possible	none	none	none
Supply voltage display	green LED	green LED	green LED	green LED
Group error display	red SF LED	red SF LED	red LED	red LED
Channel error display	none	none	none	none
Isolation				
Between channels	-	-	-	✓
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
PWM data				
PWM channels	-	-	-	-
PWM time basis	-	-	-	-
Period length	-	-	-	-
Minimum pulse width	-	-	-	-
PtP communication	-	-	-	-
Safety				
Safety protocol	-	-	-	-
Safety requirements	-	-	-	-
Secure user address	-	-	-	-
Watchdog	-	-	-	-
Two channels	-	-	-	-
Test pulse length	-	-	-	-
Circuit monitoring	-	-	-	-
Datasizes				
Input bytes	4	0	0	0
Output bytes	20 / 60	1	1	1
Parameter bytes	6	0	0	0
Diagnostic bytes	20	0	0	0

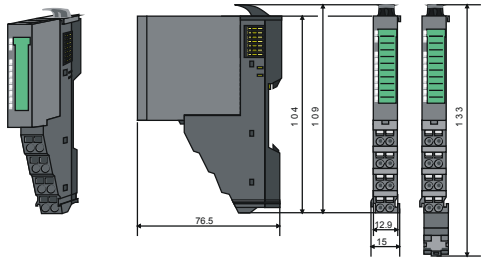
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

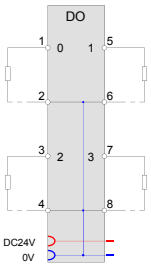
Order number	022-1BD70	022-1BF00	022-1BF50	022-1HB10
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

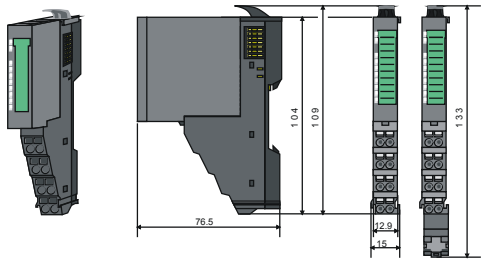
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

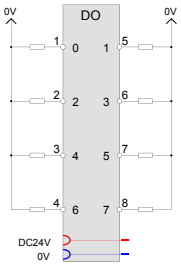
022-1BD70



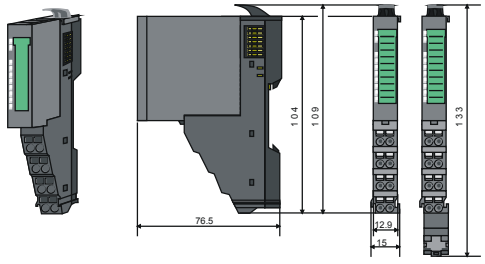


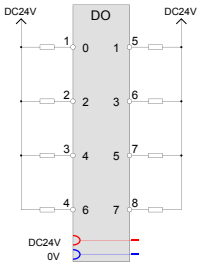
022-1BF00



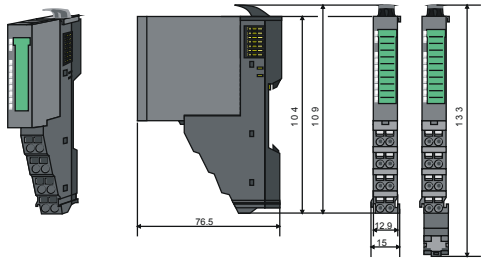


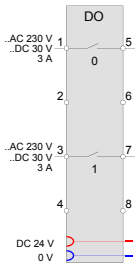
022-1BF50





022-1HB10





Digital output modules

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1DF00	022-1SD00		
Figure				
Type	SM 022	SM 022		
Module ID	0113 2F48	0C81 1E00		
General information				
Note	-	-		
Features	› 8 outputs › Output current 0.5 A › diagnosis of wiring errors	› 4 outputs › Safety › Output current 0.5 A		
Current consumption/power loss				
Current consumption from backplane bus	65 mA	75 mA		
Power loss	1 W	1 W		
Technical data digital outputs				
Number of outputs	8	4		
Cable length, shielded	1000 m	1000 m		
Cable length, unshielded	600 m	600 m		
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V		
Current consumption from load voltage L+ (without load)	11 mA	15 mA		
Total current per group, horizontal configuration, 40°C	4 A	2 A		
Total current per group, horizontal configuration, 60°C	4 A	-		
Total current per group, vertical configuration	4 A	-		
Output current at signal "1", rated value	0.5 A	0.5 A		
Output delay of "0" to "1"	max. 350 µs	100 µs		
Output delay of "1" to "0"	max. 350 µs	175 µs		
Minimum load current	-	-		
Lamp load	10 W	5 W		
Parallel switching of outputs for redundant control of a load	not possible	not possible		
Parallel switching of outputs for increased power	not possible	not possible		
Actuation of digital input	✓	✓		
Switching frequency with resistive load	max. 1000 Hz	max. 50 Hz		
Switching frequency with inductive load	max. 0.5 Hz	max. 0.5 Hz		
Switching frequency on lamp load	max. 10 Hz	max. 10 Hz		
Internal limitation of inductive shut-off voltage	L+ (-52 V)	L+ (-45 V)		
Short-circuit protection of output	yes, electronic	yes, electronic		
Trigger level	1 A	1.7 A		
Number of operating cycle of relay outputs	-	-		

Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

Order number	022-1DF00	022-1SD00		
Switching capacity of contacts	-	-		
Output data size	8 Bit	4 Bit		
Status information, alarms, diagnostics				
Status display	green LED per channel	green LED per channel		
Interrupts	yes, parameterizable	yes, parameterizable		
Process alarm	no	no		
Diagnostic interrupt	yes, parameterizable	yes, parameterizable		
Diagnostic functions	yes	yes, parameterizable		
Diagnostics information read-out	possible	possible		
Supply voltage display	green LED	green LED		
Group error display	red SF LED	red SF LED		
Channel error display	none	red ERR-LED and yellow ER2-LED		
Isolation				
Between channels	-	-		
Between channels of groups to	-	-		
Between channels and backplane bus	✓	✓		
Insulation tested with	DC 500 V	DC 500 V		
PWM data				
PWM channels	-	-		
PWM time basis	-	-		
Period length	-	-		
Minimum pulse width	-	-		
PtP communication	-	-		
Safety				
Safety protocol	-	PROFIsafe V2		
Safety requirements	-	SIL CL 3, PL e, Kat 4		
Secure user address	-	1 - 4095		
Watchdog	-	parameterizable 10ms - 1s		
Two channels	-	Each 2 of 4 outputs switchable		
Test pulse length	-	parameterizable 500µs - 10ms		
Circuit monitoring	-	✓		
Datasizes				
Input bytes	0	5		
Output bytes	1	5		
Parameter bytes	7	44		
Diagnostic bytes	20	20		

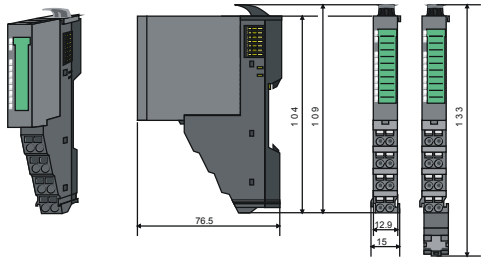
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

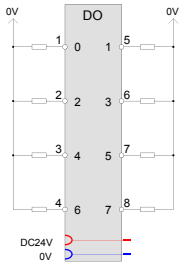
Order number	022-1DF00	022-1SD00		
Housing				
Material	PPE / PPE GF10	PC / PPE GF10		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm		
Weight	60 g	60 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	in preparation	in preparation		

Connections, Interfaces

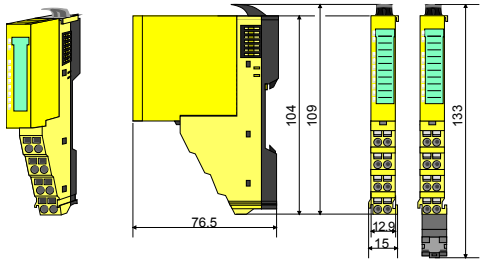
Signal modules digital | Digital output modules						
022-1BB00 022-1BB20 022-1BB50 022-1BB70	022-1BB90 022-1BD00 022-1BD20 022-1BD50	022-1BD70 022-1BF00 022-1BF50 022-1HB10	022-1DF00 022-1SD00			

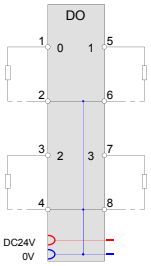
022-1DF00



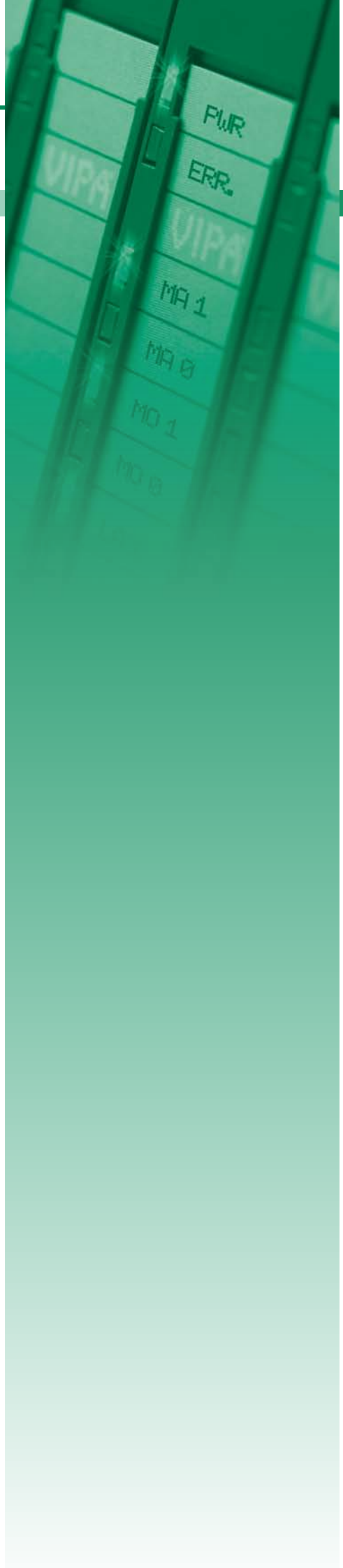


022-1SD00





Signal modules analog



Structure and Function

Signal modules (SM) to connect sensors and actuators are the interfaces of the system to the process. Analog signal modules acquire the analog control signals (e.g. measurement data) to and out of the process level. Depending on the application and type the control signals are acquired from the process level and converted into interpretable signals for controlling. Analog output modules convert the internal control signals into signals suitable for the process level.

A variety of different analog signal modules accurately provide the inputs and outputs that are required for each task. The analog modules differ in the number of channels, voltage and current ranges, isolation, and diagnostic and alarm capability.

Each signal module consists of a terminal and an electronics module.

The terminal module (TM) contains the retainer for the electronic module (EM), the backplane connectors and contacts for the distribution of the load power supply electronics, the modular connection to DC 24 V load power supply and the staircase-shaped terminal block for the wiring.

Furthermore the terminal module processes a locking system for fixing to a profile rail. The SLIO system can also be constructed "block by block" outside the cabinet and later assembled as a complete system in the control cabinet.

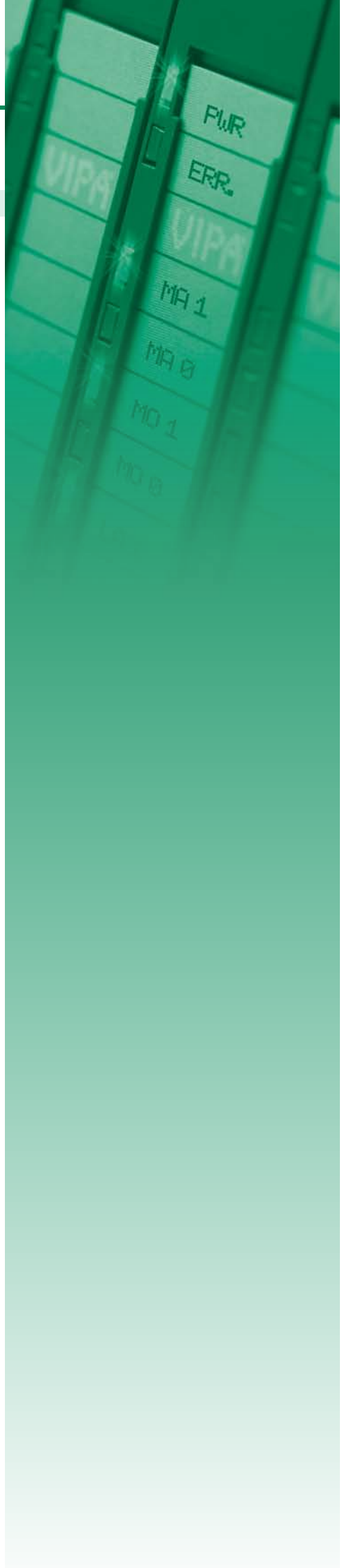
The functionality of the signal module is defined via the electronics module that is connected by a secure sliding mechanism to the terminal module.

During service the defective electronic module can be replaced without detaching the wiring.

Characteristics

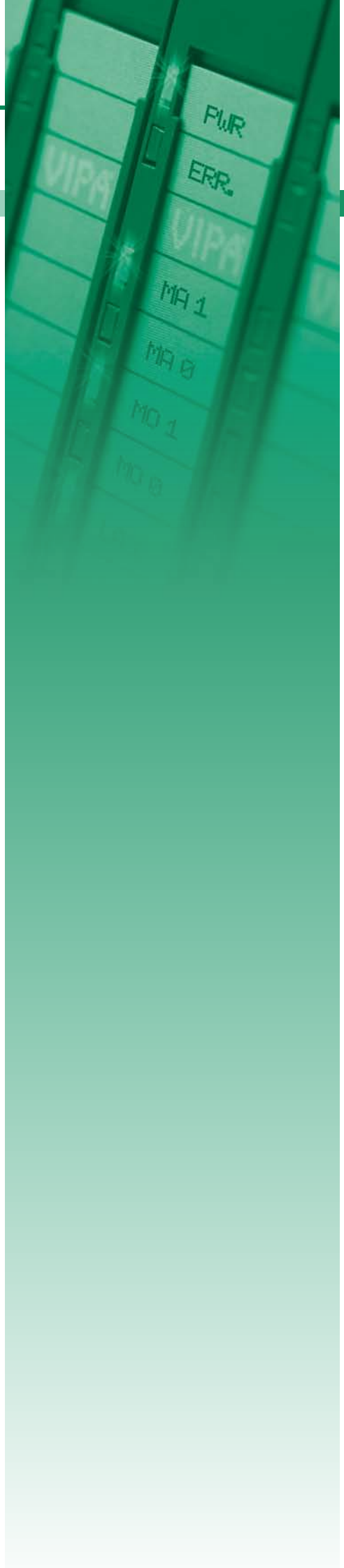
- 2 or 4 channel
- 12 bit or 16 bit resolution
- Functions of the inputs / outputs programmable
- Most various assemblies, suitable for measuring transducers (current/ voltage, resistance or temperature sensors)
- Direct mapping and readability of the channel conditions via status LEDs
- Safe and time-saving installation by the terminal assignment mounted on the module
- When changing the module equipment identification (BMK) is retained on the TM
- Individual single-channel lettering on insertion strip
- 24 month warranty

Overview



Order no.	Name/Description	Page
Analog input modules		
031-1BB10	**SM 031 - Analog input** › 2 inputs 12Bit › Current 4...20 mA › 2 wire	**77**
031-1BB30	**SM 031 - Analog input** › 2 inputs 12Bit › Voltage 0...10 V	**77**
031-1BB40	**SM 031 - Analog input** › 2 inputs 12Bit › Current 0(4)...20 mA	**77**
031-1BB60	**SM 031 - Analog input** › 2 inputs 12Bit › Current 4...20 mA › 2 wire	**77**
031-1BB70	**SM 031 - Analog input** › 2 inputs 12Bit › Voltage -10 V...+10 V	**81**
031-1BB90	**SM 031 - Analog input** › 2 inputs 16Bit › Thermocouple › Voltage -80mV...+80mV	**81**
031-1BD30	**SM 031 - Analog input** › 4 inputs 12Bit › Voltage 0...10 V	**81**
031-1BD40	**SM 031 - Analog input** › 4 inputs 12Bit › Current 0(4)...20 mA	**81**
031-1BD70	**SM 031 - Analog input** › 4 inputs 12Bit › Voltage -10 V...+10 V	**85**
031-1BD80	**SM 031 - Analog input** › 4 inputs 16Bit › 0 .. 3000 ohm resistance › Resistance measurment with 2, 3, and 4-wires	**85**
031-1CB30	**SM 031 - Analog input** › 2 inputs 16Bit › Voltage 0...10 V	**85**
031-1CB40	**SM 031 - Analog input** › 2 inputs 16Bit › Current 0(4)...20 mA	**85**
031-1CB70	**SM 031 - Analog input** › 2 inputs 16Bit › Voltage -10 V...+10 V	**89**
031-1CD30	**SM 031 - Analog input** › 4 inputs 16Bit › Voltage 0...10 V	**89**
031-1CD35	**SM 031 - Analog input** › 4 inputs 16Bit › Voltage 0...10 V	**89**
031-1CD40	**SM 031 - Analog input** › 4 inputs 16Bit › Current 0(4)...20 mA	**89**
031-1CD45	**SM 031 - Analog input** › 4 inputs 16Bit › Current 0(4)...20 mA	**93**
031-1CD70	**SM 031 - Analog input** › 4 inputs 16Bit › Voltage -10 V...+10 V	**93**
031-1LB90	**SM 031 - Analog input** › 2 inputs 16Bit › Thermocouple › Voltage -80mV...+80mV › reqires less parameter bytes than module 031-1BB90	**93**
031-1LD80	**SM 031 - Analog input** › 4 inputs 16Bit › 0 .. 3000 ohm resistance › Resistance measurment with 2, 3, and 4-wires › reqires less parameter bytes than module 031-1BD80	**93**

Overview



Order no.	Name/Description	Page
Analog output modules		
032-1BB30	**SM 032 - Analog output** › 2 outputs 12Bit › Voltage 0...10 V	**98**
032-1BB40	**SM 032 - Analog output** › 2 outputs 12Bit › Current 0(4)...20 mA	**98**
032-1BB70	**SM 032 - Analog output** › 2 outputs 12Bit › Voltage -10 V...+10 V	**98**
032-1BD30	**SM 032 - Analog output** › 4 outputs 12Bit › Voltage 0...10 V	**98**
032-1BD40	**SM 032 - Analog output** › 4 outputs 12Bit › Current 0(4)...20mA	**101**
032-1BD70	**SM 032 - Analog output** › 4 outputs 12Bit › Voltage -10 V...+10 V	**101**
032-1CB30	**SM 032 - Analog output** › 2 outputs 16Bit › Voltage 0...10 V	**101**
032-1CB70	**SM 032 - Analog output** › 2 outputs 16Bit › Voltage -10 V...+10 V	**101**
032-1CD30	**SM 032 - Analog output** › 4 outputs 16Bit › Voltage 0...10 V	**104**
032-1CD70	**SM 032 - Analog output** › 4 outputs 16Bit › Voltage -10 V...+10 V	**104**

Analog input modules

Signal modules analog | Analog input modules						
031-1BB10	031-1BB70	031-1BD70	031-1CB70	031-1CD45		
031-1BB30	031-1BB90	031-1BD80	031-1CD30	031-1CD70		
031-1BB40	031-1BD30	031-1CB30	031-1CD35	031-1LB90		
031-1BB60	031-1BD40	031-1CB40	031-1CD40	031-1LD80		

Order number	031-1BB10	031-1BB30	031-1BB40	031-1BB60
Figure				
Type	SM 031	SM 031	SM 031	SM 031
Module ID	0411 1543	0401 15C3	0402 15C3	0407 15C3
General information				
Note	-	-	-	-
Features	› 2 inputs 12Bit › Current 4...20 mA › 2 wire	› 2 inputs 12Bit › Voltage 0...10 V	› 2 inputs 12Bit › Current 0(4)...20 mA	› 2 inputs 12Bit › Current 4...20 mA › 2 wire
Current consumption/power loss				
Current consumption from backplane bus	50 mA	70 mA	70 mA	50 mA
Power loss	0.7 W	0.7 W	0.7 W	0.7 W
Technical data analog inputs				
Number of inputs	2	2	2	2
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Current consumption from load voltage L+ (without load)	20 mA	15 mA	15 mA	15 mA
Voltage inputs	-	✓	-	-
Min. input resistance (voltage range)	-	100 kΩ	-	-
Input voltage ranges	-	0 V ... +10 V	-	-
Operational limit of voltage ranges	-	+/-0.3%	-	-
Operational limit of voltage ranges with SFU	-	-	-	-
Basic error limit voltage ranges	-	+/-0.2%	-	-
Basic error limit voltage ranges with SFU	-	-	-	-
Destruction limit current	-	-	-	-
Current inputs	✓	-	✓	✓
Max. input resistance (current range)	60 Ω	-	110 Ω	110 Ω
Input current ranges	+4 mA ... +20 mA 0 mA ... +20 mA	-	0 mA ... +20 mA +4 mA ... +20 mA	0 mA ... +20 mA +4 mA ... +20 mA
Operational limit of current ranges	+/-0.5%	-	+/-0.3% ... +/-0.5%	+/-0.5%
Operational limit of current ranges with SFU	-	-	-	-
Basic error limit current ranges	+/-0.3%	-	+/-0.2% ... +/-0.3%	+/-0.3%
Radical error limit current ranges with SFU	-	-	-	-
Destruction limit current inputs (voltage)	-	-	-	-
Destruction limit current inputs (electrical current)	-	-	-	-
Resistance inputs	-	-	-	-
Resistance ranges	-	-	-	-
Operational limit of resistor ranges	-	-	-	-
Operational limit of resistor ranges with SFU	-	-	-	-

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1BB10	031-1BB30	031-1BB40	031-1BB60
Basic error limit	-	-	-	-
Basic error limit with SFU	-	-	-	-
Destruction limit resistance inputs	-	-	-	-
Resistance thermometer inputs	-	-	-	-
Resistance thermometer ranges	-	-	-	-
Operational limit of resistance thermometer ranges	-	-	-	-
Operational limit of resistance thermometer ranges with SFU	-	-	-	-
Basic error limit thermoresistor ranges	-	-	-	-
Operational limit of resistance thermometer ranges with SFU	-	-	-	-
Destruction limit resistance thermometer inputs	-	-	-	-
Thermocouple inputs	-	-	-	-
Thermocouple ranges	-	-	-	-
Operational limit of thermocouple ranges	-	-	-	-
Operational limit of thermocouple ranges with SFU	-	-	-	-
Basic error limit thermoelement ranges	-	-	-	-
Basic error limit thermoelement ranges with SFU	-	-	-	-
Destruction limit thermocouple inputs	-	-	-	-
Programmable temperature compensation	-	-	-	-
External temperature compensation	-	-	-	-
Internal temperature compensation	-	-	-	-
Internal temperature compensation	-	-	-	-
Technical unit of temperature measurement	-	-	-	-
Resolution in bit	12	12	12	12
Measurement principle	successive approximation	successive approximation	successive approximation	successive approximation
Basic conversion time	1.15 ms all channels	2 ms all channels	2 ms all channels	2 ms all channels
Noise suppression for frequency	>80dB (UCM<20V)	>50dB at 50Hz (UCM<2V)	>50dB at 50Hz (UCM<2V)	>50dB at 50Hz (UCM<2V)
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	yes, parameterizable	no	no	no
Process alarm	yes, parameterizable	no	no	no
Diagnostic interrupt	yes, parameterizable	no	no	no
Diagnostic functions	yes	yes	yes	yes
Diagnostics information read-out	possible	possible	possible	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	red LED per channel	red LED per channel	red LED per channel	red LED per channel

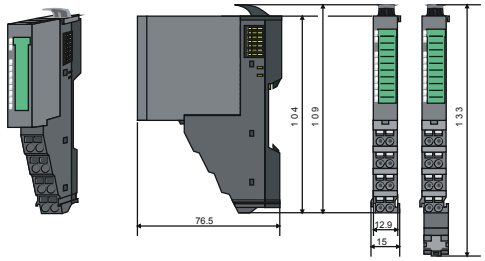
Signal modules analog | Analog input modules						
031-1BB10	031-1BB70	031-1BD70	031-1CB70	031-1CD45		
031-1BB30	031-1BB90	031-1BD80	031-1CD30	031-1CD70		
031-1BB40	031-1BD30	031-1CB30	031-1CD35	031-1LB90		
031-1BB60	031-1BD40	031-1CB40	031-1CD40	031-1LD80		

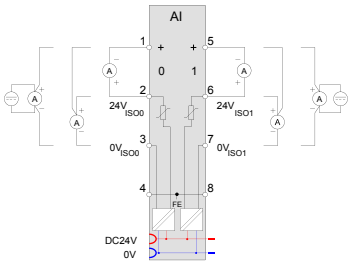
Order number	031-1BB10	031-1BB30	031-1BB40	031-1BB60
Isolation				
Between channels	✓	-	-	-
Between channels of groups to	1	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	✓	✓	✓	-
Max. potential difference between circuits	DC 75 V/ AC 60 V	-	-	-
Max. potential difference between inputs (Ucm)	DC 75 V/ AC 60 V	DC 2 V	DC 2 V	-
Max. potential difference between Mana and Mintern (Uiso)	-	-	-	-
Max. potential difference between inputs and Mana (Ucm)	DC 75 V/ AC 60 V	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	4	4	4	4
Output bytes	0	0	0	0
Parameter bytes	20	6	6	6
Diagnostic bytes	20	20	20	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

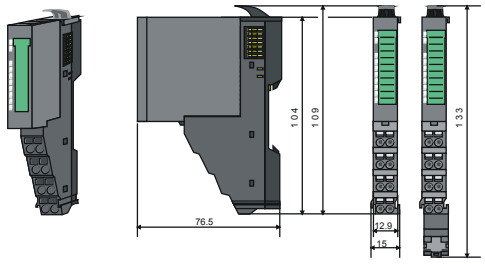
Signal modules analog | Analog input modules						
031-1BB10	031-1BB70	031-1BD70	031-1CB70	031-1CD45		
031-1BB30	031-1BB90	031-1BD80	031-1CD30	031-1CD70		
031-1BB40	031-1BD30	031-1CB30	031-1CD35	031-1LB90		
031-1BB60	031-1BD40	031-1CB40	031-1CD40	031-1LD80		

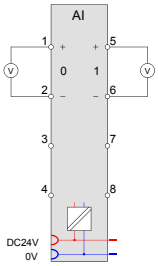
031-1BB10



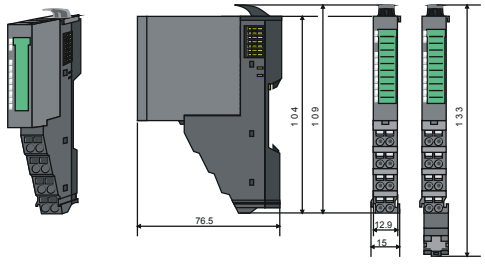


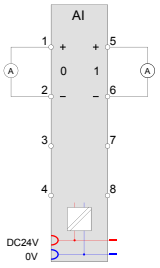
031-1BB30



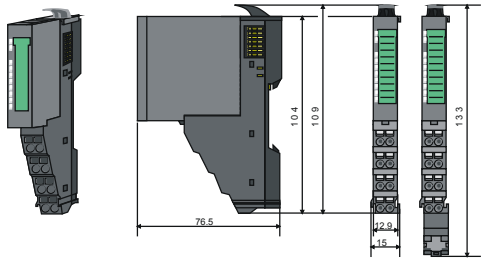


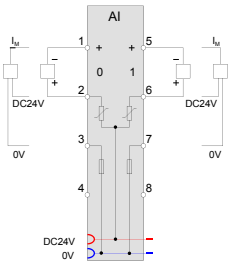
031-1BB40





031-1BB60





Analog input modules

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1BB70	031-1BB90	031-1BD30	031-1BD40
Figure				
Type	SM 031	SM 031	SM 031	SM 031
Module ID	0408 15C3	0403 1543	0404 15C4	0405 15C4
General information				
Note	-	-	-	-
Features	› 2 inputs 12Bit › Voltage -10 V...+10 V	› 2 inputs 16Bit › Thermocouple › Voltage -80mV...+80mV	› 4 inputs 12Bit › Voltage 0...10 V	› 4 inputs 12Bit › Current 0(4)...20 mA
Current consumption/power loss				
Current consumption from backplane bus	50 mA	75 mA	70 mA	70 mA
Power loss	0.5 W	1.1 W	0.7 W	0.7 W
Technical data analog inputs				
Number of inputs	2	2	4	4
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Current consumption from load voltage L+ (without load)	15 mA	30 mA	15 mA	15 mA
Voltage inputs	✓	-	✓	-
Min. input resistance (voltage range)	100 kΩ	10 MΩ	100 kΩ	-
Input voltage ranges	-10 V ... +10 V	-80 mV ... +80 mV	0 V ... +10 V	-
Operational limit of voltage ranges	+/-0.3%	±0.3%	+/-0.3%	-
Operational limit of voltage ranges with SFU	-	±0.1%	-	-
Basic error limit voltage ranges	+/-0.2%	±0.25%	+/-0.2%	-
Basic error limit voltage ranges with SFU	-	±0.05%	-	-
Destruction limit current	-	-	-	-
Current inputs	-	-	-	✓
Max. input resistance (current range)	-	-	-	110 Ω
Input current ranges	-	-	-	0 mA ... +20 mA +4 mA ... +20 mA
Operational limit of current ranges	-	-	-	+/-0.3% ... +/-0.5%
Operational limit of current ranges with SFU	-	-	-	-
Basic error limit current ranges	-	-	-	+/-0.2% ... +/-0.3%
Radical error limit current ranges with SFU	-	-	-	-
Destruction limit current inputs (voltage)	-	-	-	-
Destruction limit current inputs (electrical current)	-	-	-	-
Resistance inputs	-	-	-	-
Resistance ranges	-	-	-	-
Operational limit of resistor ranges	-	-	-	-
Operational limit of resistor ranges with SFU	-	-	-	-

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1BB70	031-1BB90	031-1BD30	031-1BD40
Basic error limit	-	-	-	-
Basic error limit with SFU	-	-	-	-
Destruction limit resistance inputs	-	-	-	-
Resistance thermometer inputs	-	-	-	-
Resistance thermometer ranges	-	-	-	-
Operational limit of resistance thermometer ranges	-	-	-	-
Operational limit of resistance thermometer ranges with SFU	-	-	-	-
Basic error limit thermoresistor ranges	-	-	-	-
Operational limit of resistance thermometer ranges with SFU	-	-	-	-
Destruction limit resistance thermometer inputs	-	-	-	-
Thermocouple inputs	-	✓	-	-
Thermocouple ranges	-	type B type C type E type J type K type L type N type R type S type T	-	-
Operational limit of thermocouple ranges	-	Type E, L, T, J, K, N: ±2.5K / Type B, C, R, S: ±8.0K	-	-
Operational limit of thermocouple ranges with SFU	-	Type E, L, T, J, K, N: ±1.5K / Type B, C, R, S: ±4.0K	-	-
Basic error limit thermoelement ranges	-	Type E, L, T, J, K, N: ±2.0K / Type B, C, R, S: ±7.0K	-	-
Basic error limit thermoelement ranges with SFU	-	Type E, L, T, J, K, N: ±1.0K / Type B, C, R, S: ±3.0K	-	-
Destruction limit thermocouple inputs	-	-	-	-
Programmable temperature compensation	-	✓	-	-
External temperature compensation	-	✓	-	-
Internal temperature compensation	-	✓	-	-
Internal temperature compensation	-	1 K	-	-
Technical unit of temperature measurement	-	-	-	-
Resolution in bit	12	16	12	12
Measurement principle	successive approximation	Sigma-Delta	successive approximation	successive approximation
Basic conversion time	2 ms all channels	4.2...324.1 ms (50 Hz) 3.8...270.5 ms (60 Hz) per channel	4 ms all channels	4 ms all channels
Noise suppression for frequency	>50dB at 50Hz (UCM<2V)	>90dB at 50Hz (UCM<10V)	>50dB at 50Hz (UCM<2V)	>50dB at 50Hz (UCM<2V)

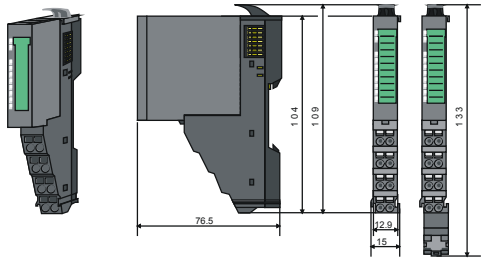
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

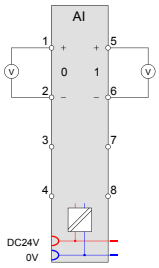
Order number	031-1BB70	031-1BB90	031-1BD30	031-1BD40
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	no	yes	no	no
Process alarm	no	yes, parameterizable	no	no
Diagnostic interrupt	no	yes, parameterizable	no	no
Diagnostic functions	yes	yes	yes	yes
Diagnostics information read-out	possible	possible	possible	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	red LED per channel	red LED per channel	red LED per channel	red LED per channel
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	✓	-	✓	✓
Max. potential difference between circuits	-	-	-	-
Max. potential difference between inputs (Ucm)	DC 2 V	DC 140 V/ AC 60 V	DC 2 V	DC 2 V
Max. potential difference between Mana and Mintern (Uiso)	-	-	-	-
Max. potential difference between inputs and Mana (Ucm)	-	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	4	4	8	8
Output bytes	0	0	0	0
Parameter bytes	6	22	8	8
Diagnostic bytes	20	20	20	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

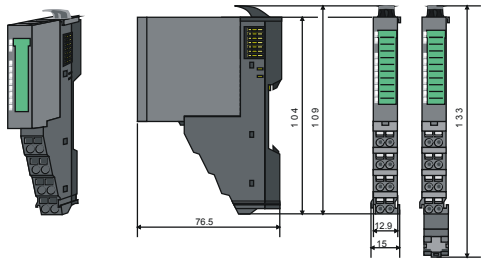
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

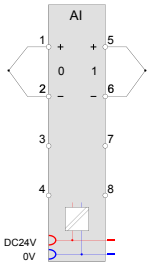
031-1BB70



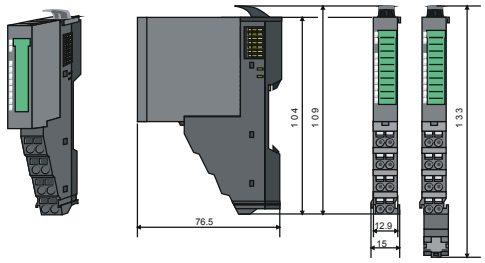


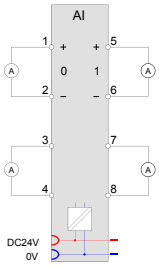
031-1BB90



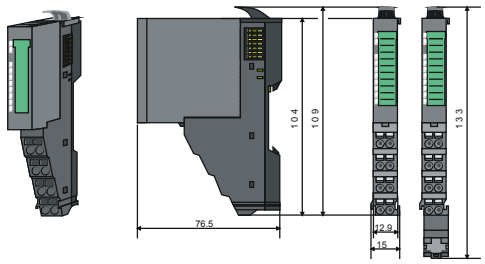


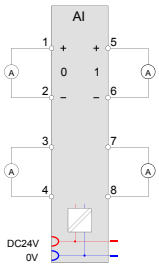
031-1BD30





031-1BD40





Analog input modules

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1BD70	031-1BD80	031-1CB30	031-1CB40
Figure				
Type	SM 031	SM 031	SM 031	SM 031
Module ID	0409 15C4	0406 1544	040A 1543	040B 1543
General information				
Note	-	-	-	-
Features	› 4 inputs 12Bit › Voltage -10 V...+10 V	› 4 inputs 16Bit › 0 .. 3000 ohm resistance › Resistance measurment with 2, 3, and 4-wires	› 2 inputs 16Bit › Voltage 0...10 V	› 2 inputs 16Bit › Current 0(4)...20 mA
Current consumption/power loss				
Current consumption from backplane bus	50 mA	75 mA	60 mA	60 mA
Power loss	0.5 W	1 W	0.8 W	0.7 W
Technical data analog inputs				
Number of inputs	4	4	2	2
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Current consumption from load voltage L+ (without load)	15 mA	30 mA	20 mA	15 mA
Voltage inputs	✓	-	✓	-
Min. input resistance (voltage range)	100 kΩ	-	200 kΩ	-
Input voltage ranges	-10 V ... +10 V	-	0 V ... +10 V	-
Operational limit of voltage ranges	+/-0.3%	-	+/-0.2%	-
Operational limit of voltage ranges with SFU	-	-	-	-
Basic error limit voltage ranges	+/-0.2%	-	+/-0.1%	-
Basic error limit voltage ranges with SFU	-	-	-	-
Destruction limit current	-	-	-	-
Current inputs	-	-	-	✓
Max. input resistance (current range)	-	-	-	60 Ω
Input current ranges	-	-	-	0 mA ... +20 mA +4 mA ... +20 mA
Operational limit of current ranges	-	-	-	+/-0.2%
Operational limit of current ranges with SFU	-	-	-	-
Basic error limit current ranges	-	-	-	+/-0.1%
Radical error limit current ranges with SFU	-	-	-	-
Destruction limit current inputs (voltage)	-	-	-	-
Destruction limit current inputs (electrical current)	-	-	-	-
Resistance inputs	-	✓	-	-

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1BD70	031-1BD80	031-1CB30	031-1CB40
Resistance ranges	-	0 ... 60 Ohm 0 ... 600 Ohm 0 ... 3000 Ohm	-	-
Operational limit of resistor ranges	-	+/- 0.4 %	-	-
Operational limit of resistor ranges with SFU	-	+/- 0,2 %	-	-
Basic error limit	-	+/- 0.2 %	-	-
Basic error limit with SFU	-	+/- 0,1 %	-	-
Destruction limit resistance inputs	-	-	-	-
Resistance thermometer inputs	-	✓	-	-
Resistance thermometer ranges	-	Pt100 Pt1000 Ni100 Ni1000	-	-
Operational limit of resistance thermometer ranges	-	+/- 0.4 %	-	-
Operational limit of resistance thermometer ranges with SFU	-	+/- 0,2 %	-	-
Basic error limit thermoresistor ranges	-	+/- 0.2 %	-	-
Operational limit of resistance thermometer ranges with SFU	-	+/- 0,1 %	-	-
Destruction limit resistance thermometer inputs	-	-	-	-
Thermocouple inputs	-	-	-	-
Thermocouple ranges	-	-	-	-
Operational limit of thermocouple ranges	-	-	-	-
Operational limit of thermocouple ranges with SFU	-	-	-	-
Basic error limit thermoelement ranges	-	-	-	-
Basic error limit thermoelement ranges with SFU	-	-	-	-
Destruction limit thermocouple inputs	-	-	-	-
Programmable temperature compensation	-	-	-	-
External temperature compensation	-	-	-	-
Internal temperature compensation	-	-	-	-
Internal temperature compensation	-	-	-	-
Technical unit of temperature measurement	-	-	-	-
Resolution in bit	12	16	16	16
Measurement principle	successive approximation	Sigma-Delta	successive approximation	successive approximation
Basic conversion time	4 ms all channels	4.2...324.1 ms (50 Hz) 3.8...270.5 ms (60 Hz) per channel	240 µs all channels	240 µs all channels
Noise suppression for frequency	>50dB at 50Hz (UCM<2V)	>80dB at 50Hz (UCM<6V)	>80dB at 50Hz (UCM<9V)	>80dB (UCM<4V)

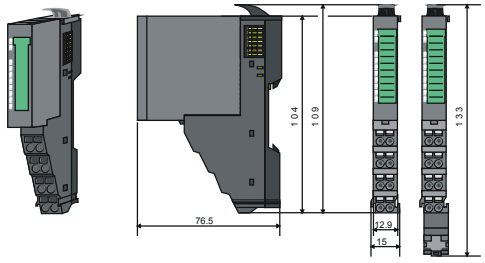
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

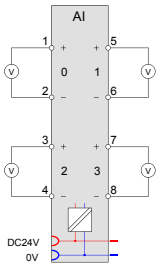
Order number	031-1BD70	031-1BD80	031-1CB30	031-1CB40
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	no	yes, parameterizable	yes, parameterizable	yes, parameterizable
Process alarm	no	yes, parameterizable	yes, parameterizable	yes, parameterizable
Diagnostic interrupt	no	yes, parameterizable	yes, parameterizable	yes, parameterizable
Diagnostic functions	yes	yes	yes	yes
Diagnostics information read-out	possible	possible	possible	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	red LED per channel	red LED per channel	red LED per channel	red LED per channel
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	✓	-	✓	✓
Max. potential difference between circuits	-	-	-	-
Max. potential difference between inputs (Ucm)	DC 2 V	DC 6 V	DC 9 V	DC 4 V
Max. potential difference between Mana and Mintern (Uiso)	-	-	-	-
Max. potential difference between inputs and Mana (Ucm)	-	-	DC 1 V	DC 3 V
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	8	8	4	4
Output bytes	0	0	0	0
Parameter bytes	8	34	20	20
Diagnostic bytes	20	20	20	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

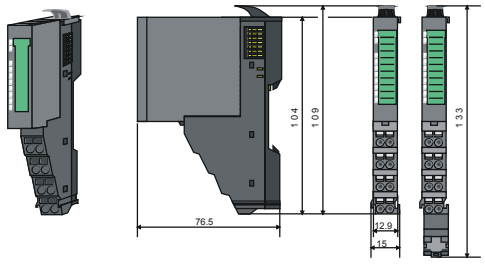
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

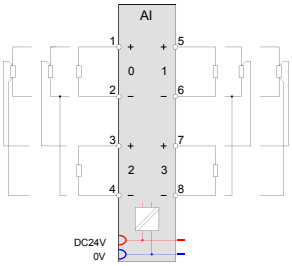
031-1BD70



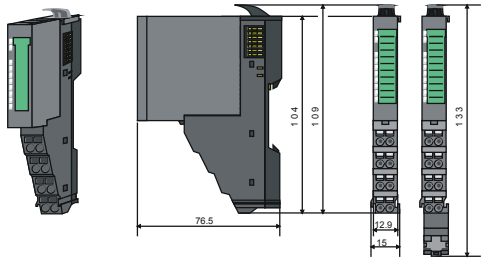


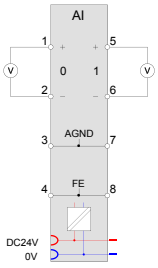
031-1BD80



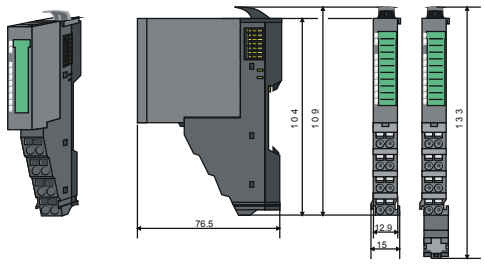


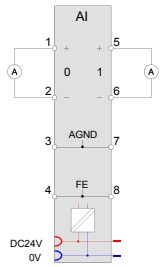
031-1CB30





031-1CB40





Analog input modules

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1CB70	031-1CD30	031-1CD35	031-1CD40
Figure				
Type	SM 031	SM 031	SM 031	SM 031
Module ID	040C 1543	040D 1544	0413 15C4	0412 1544
General information				
Note	-	-	-	-
Features	› 2 inputs 16Bit › Voltage -10 V...+10 V	› 4 inputs 16Bit › Voltage 0...10 V	› 4 inputs 16Bit › Voltage 0...10 V	› 4 inputs 16Bit › Current 0(4)...20 mA
Current consumption/power loss				
Current consumption from backplane bus	60 mA	60 mA	60 mA	60 mA
Power loss	0.8 W	0.9 W	0.9 W	0.8 W
Technical data analog inputs				
Number of inputs	2	4	4	4
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Current consumption from load voltage L+ (without load)	20 mA	25 mA	25 mA	20 mA
Voltage inputs	✓	✓	✓	-
Min. input resistance (voltage range)	200 kΩ	200 kΩ	200 kΩ	-
Input voltage ranges	-10 V ... +10 V	0 V ... +10 V	0 V ... +10 V	-
Operational limit of voltage ranges	+/-0.2%	+/-0.2%	+/-0.2%	-
Operational limit of voltage ranges with SFU	-	-	-	-
Basic error limit voltage ranges	+/-0.1%	+/-0.1%	+/-0.1%	-
Basic error limit voltage ranges with SFU	-	-	-	-
Destruction limit current	-	-	-	-
Current inputs	-	-	-	✓
Max. input resistance (current range)	-	-	-	60 Ω
Input current ranges	-	-	-	0 mA ... +20 mA +4 mA ... +20 mA
Operational limit of current ranges	-	-	-	+/-0.2%
Operational limit of current ranges with SFU	-	-	-	-
Basic error limit current ranges	-	-	-	+/-0.1%
Radical error limit current ranges with SFU	-	-	-	-
Destruction limit current inputs (voltage)	-	-	-	-
Destruction limit current inputs (electrical current)	-	-	-	-
Resistance inputs	-	-	-	-
Resistance ranges	-	-	-	-
Operational limit of resistor ranges	-	-	-	-
Operational limit of resistor ranges with SFU	-	-	-	-
Basic error limit	-	-	-	-

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1CB70	031-1CD30	031-1CD35	031-1CD40
Basic error limit with SFU	-	-	-	-
Destruction limit resistance inputs	-	-	-	-
Resistance thermometer inputs	-	-	-	-
Resistance thermometer ranges	-	-	-	-
Operational limit of resistance thermometer ranges	-	-	-	-
Operational limit of resistance thermometer ranges with SFU	-	-	-	-
Basic error limit thermoresistor ranges	-	-	-	-
Operational limit of resistance thermometer ranges with SFU	-	-	-	-
Destruction limit resistance thermometer inputs	-	-	-	-
Thermocouple inputs	-	-	-	-
Thermocouple ranges	-	-	-	-
Operational limit of thermocouple ranges	-	-	-	-
Operational limit of thermocouple ranges with SFU	-	-	-	-
Basic error limit thermoelement ranges	-	-	-	-
Basic error limit thermoelement ranges with SFU	-	-	-	-
Destruction limit thermocouple inputs	-	-	-	-
Programmable temperature compensation	-	-	-	-
External temperature compensation	-	-	-	-
Internal temperature compensation	-	-	-	-
Internal temperature compensation	-	-	-	-
Technical unit of temperature measurement	-	-	-	-
Resolution in bit	16	16	16	16
Measurement principle	successive approximation	successive approximation	successive approximation	successive approximation
Basic conversion time	240 µs all channels	480 µs all channels	480 µs all channels	240 µs all channels
Noise suppression for frequency	>80dB at 50Hz (UCM<9V)	>80dB at 50Hz (UCM<9V)	>80dB at 50Hz (UCM<9V)	>80dB (UCM<4V)
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	yes, parameterizable	yes, parameterizable	no	yes, parameterizable
Process alarm	yes, parameterizable	yes, parameterizable	no	yes, parameterizable
Diagnostic interrupt	yes, parameterizable	yes, parameterizable	no	yes, parameterizable
Diagnostic functions	yes	yes	yes	yes
Diagnostics information read-out	possible	possible	possible	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	red LED per channel	red LED per channel	red LED per channel	red LED per channel

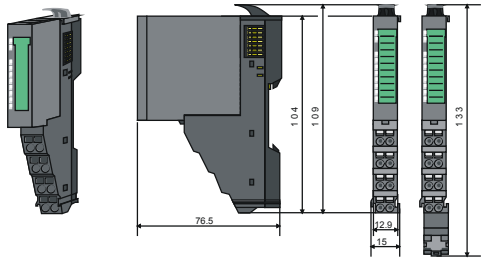
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

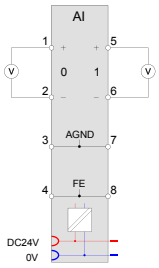
Order number	031-1CB70	031-1CD30	031-1CD35	031-1CD40
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	✓	✓	✓	✓
Max. potential difference between circuits	-	-	-	-
Max. potential difference between inputs (Ucm)	DC 9 V	DC 9 V	DC 9 V	DC 4 V
Max. potential difference between Mana and Mintern (Uiso)	-	-	-	-
Max. potential difference between inputs and Mana (Ucm)	DC 1 V	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	4	8	8	8
Output bytes	0	0	0	0
Parameter bytes	20	32	9	32
Diagnostic bytes	20	20	20	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	in preparation	yes

Connections, Interfaces

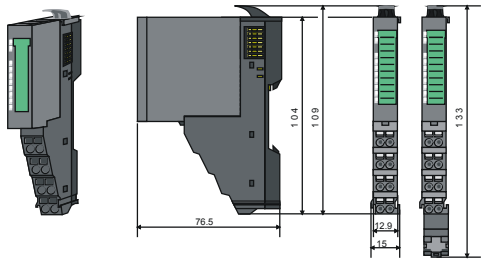
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

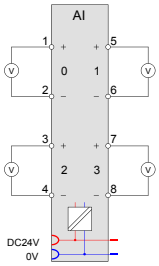
031-1CB70



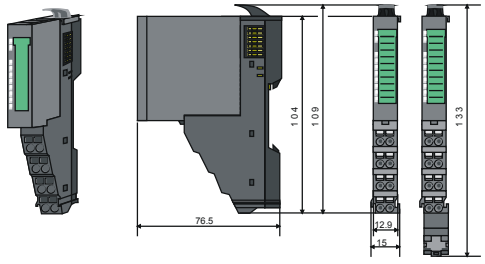


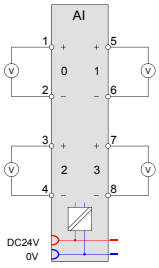
031-1CD30



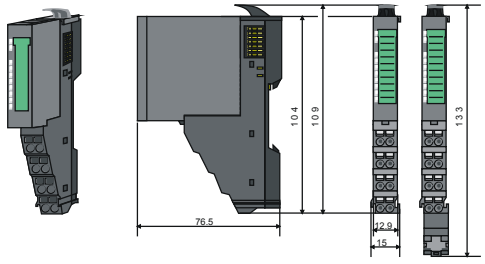


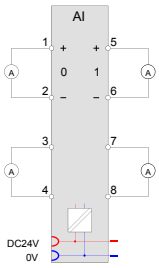
031-1CD35





031-1CD40





Analog input modules

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1CD45	031-1CD70	031-1LB90	031-1LD80
Figure				
Type	SM 031	SM 031	SM 031	SM 031
Module ID	0414 15C4	040E 1544	040F 1543	0410 1544
General information				
Note	-	-	-	-
Features	› 4 inputs 16Bit › Current 0(4)...20 mA	› 4 inputs 16Bit › Voltage -10 V...+10 V	› 2 inputs 16Bit › Thermocouple › Voltage -80mV...+80mV › reqires less parameter bytes than module 031-1BB90	› 4 inputs 16Bit › 0 .. 3000 ohm resistance › Resistance measurment with 2, 3, and 4-wires › reqires less parameter bytes than module 031-1BD80
Current consumption/power loss				
Current consumption from backplane bus	60 mA	60 mA	55 mA	55 mA
Power loss	0.8 W	0.9 W	1 W	1 W
Technical data analog inputs				
Number of inputs	4	4	2	4
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Current consumption from load voltage L+ (without load)	20 mA	25 mA	30 mA	30 mA
Voltage inputs	-	✓	-	-
Min. input resistance (voltage range)	-	200 kΩ	10 MΩ	-
Input voltage ranges	-	-10 V ... +10 V	-80 mV ... +80 mV	-
Operational limit of voltage ranges	-	+/-0.2%	±0.3%	-
Operational limit of voltage ranges with SFU	-	-	±0.1%	-
Basic error limit voltage ranges	-	+/-0.1%	±0.25%	-
Basic error limit voltage ranges with SFU	-	-	±0.05%	-
Destruction limit current	-	-	-	-
Current inputs	✓	-	-	-
Max. input resistance (current range)	60 Ω	-	-	-
Input current ranges	0 mA ... +20 mA +4 mA ... +20 mA	-	-	-
Operational limit of current ranges	+/-0.2%	-	-	-
Operational limit of current ranges with SFU	-	-	-	-
Basic error limit current ranges	+/-0.1%	-	-	-
Radical error limit current ranges with SFU	-	-	-	-
Destruction limit current inputs (voltage)	-	-	-	-
Destruction limit current inputs (electrical current)	-	-	-	-
Resistance inputs	-	-	-	✓

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	031-1CD45	031-1CD70	031-1LB90	031-1LD80
Resistance ranges	-	-	-	0 ... 60 Ohm 0 ... 600 Ohm 0 ... 3000 Ohm
Operational limit of resistor ranges	-	-	-	+/- 0.4 %
Operational limit of resistor ranges with SFU	-	-	-	+/- 0,2 %
Basic error limit	-	-	-	+/- 0.2 %
Basic error limit with SFU	-	-	-	+/- 0,1 %
Destruction limit resistance inputs	-	-	-	-
Resistance thermometer inputs	-	-	-	✓
Resistance thermometer ranges	-	-	-	Pt100 Pt1000 Ni100 Ni1000
Operational limit of resistance thermometer ranges	-	-	-	+/- 0.4 %
Operational limit of resistance thermometer ranges with SFU	-	-	-	+/- 0,2 %
Basic error limit thermoresistor ranges	-	-	-	+/- 0.2 %
Operational limit of resistance thermometer ranges with SFU	-	-	-	+/- 0,1 %
Destruction limit resistance thermometer inputs	-	-	-	-
Thermocouple inputs	-	-	✓	-
Thermocouple ranges	-	-	type B type C type E type J type K type L type N type R type S type T	-
Operational limit of thermocouple ranges	-	-	Type E, L, T, J, K, N: ±2.5K / Type B, C, R, S: ±8.0K	-
Operational limit of thermocouple ranges with SFU	-	-	Type E, L, T, J, K, N: ±1.5K / Type B, C, R, S: ±4.0K	-
Basic error limit thermoelement ranges	-	-	Type E, L, T, J, K, N: ±2.0K / Type B, C, R, S: ±7.0K	-
Basic error limit thermoelement ranges with SFU	-	-	Type E, L, T, J, K, N: ±1.0K / Type B, C, R, S: ±3.0K	-
Destruction limit thermocouple inputs	-	-	-	-
Programmable temperature compensation	-	-	✓	-
External temperature compensation	-	-	✓	-
Internal temperature compensation	-	-	✓	-
Internal temperature compensation	-	-	1 K	-
Technical unit of temperature measurement	-	-	-	-
Resolution in bit	16	16	16	16

Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

Order number	**031-1CD45**	**031-1CD70**	**031-1LB90**	**031-1LD80**
Measurement principle	successive approxi-mation	successive approxi-mation	Sigma-Delta	Sigma-Delta
Basic conversion time	240 µs all channels	480 µs all channels	84.2 ms (50 Hz) 70.5 ms (60 Hz) per channel	84.2 ms (50 Hz) 70.5 ms (60 Hz) per channel
Noise suppression for frequency	>80dB (UCM<4V)	>80dB at 50Hz (UCM<35V)	>90dB at 50Hz (UCM<10V)	>80dB at 50Hz (UCM<6V)
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	no	yes, parameterizable	yes	yes, parameterizable
Process alarm	no	yes, parameterizable	no	no
Diagnostic interrupt	no	yes, parameterizable	yes, parameterizable	yes, parameterizable
Diagnostic functions	yes	yes	yes	yes
Diagnostics information read-out	possible	possible	possible	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	red LED per channel	red LED per channel	red LED per channel	red LED per channel
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	✓	✓	-	-
Max. potential difference between circuits	-	-	-	-
Max. potential difference between inputs (Ucm)	DC 4 V	DC 9 V	DC 140 V/ AC 60 V	DC 6 V
Max. potential difference between Mana and Mintern (Uiso)	-	-	-	-
Max. potential difference between inputs and Mana (Ucm)	-	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	8	8	4	8
Output bytes	0	0	0	0
Parameter bytes	9	32	10	12
Diagnostic bytes	20	20	20	20

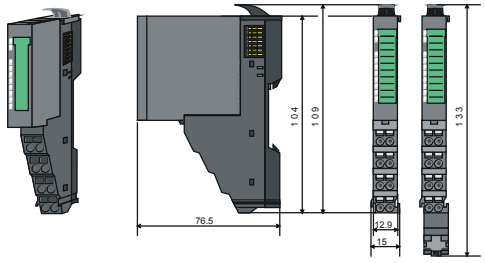
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

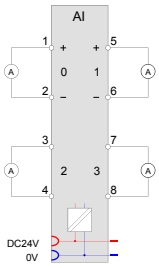
Order number	031-1CD45	031-1CD70	031-1LB90	031-1LD80
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	in preparation	yes	yes	yes

Connections, Interfaces

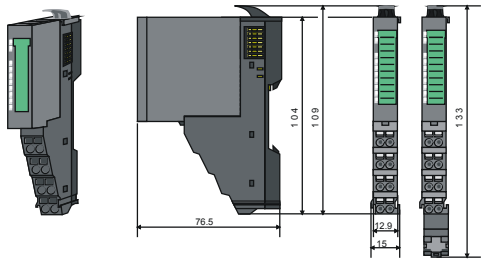
Signal modules analog | Analog input modules						
031-1BB10 031-1BB30 031-1BB40 031-1BB60	031-1BB70 031-1BB90 031-1BD30 031-1BD40	031-1BD70 031-1BD80 031-1CB30 031-1CB40	031-1CB70 031-1CD30 031-1CD35 031-1CD40	031-1CD45 031-1CD70 031-1LB90 031-1LD80		

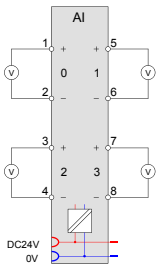
031-1CD45



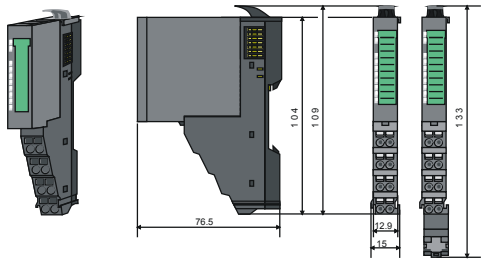


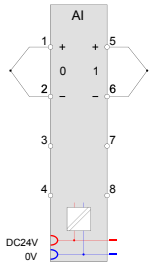
031-1CD70



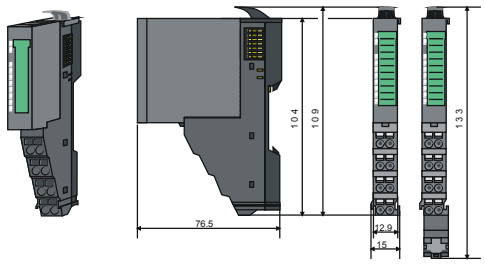


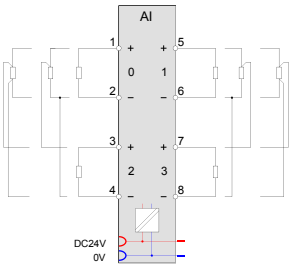
031-1LB90





031-1LD80





Analog output modules

Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

Order number	032-1BB30	032-1BB40	032-1BB70	032-1BD30
Figure				
Type	SM 032	SM 032	SM 032	SM 032
Module ID	0501 25D8	0502 25D8	0505 25D8	0503 25E0
General information				
Note	-	-	-	-
Features	› 2 outputs 12Bit › Voltage 0...10 V	› 2 outputs 12Bit › Current 0(4)...20 mA	› 2 outputs 12Bit › Voltage -10 V...+10 V	› 4 outputs 12Bit › Voltage 0...10 V
Current consumption/power loss				
Current consumption from backplane bus	80 mA	80 mA	60 mA	80 mA
Power loss	1.2 W	0.8 W	0.8 W	1.2 W
Technical data analog outputs				
Number of outputs	2	2	2	4
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Reverse polarity protection of rated load voltage	✓	✓	✓	✓
Current consumption from load voltage L+ (without load)	-	-	-	-
Voltage output short-circuit protection	✓	-	✓	✓
Voltage outputs	✓	-	✓	✓
Min. load resistance (voltage range)	5 kΩ	-	5 kΩ	5 kΩ
Max. capacitive load (current range)	1 µF	-	1 µF	1 µF
Max. inductive load (current range)	10 mA	-	10 mA	10 mA
Output voltage ranges	0 V ... +10 V	-	-10 V ... +10 V	0 V ... +10 V
Operational limit of voltage ranges	+/-0.3%	-	+/-0.3%	+/-0.3%
Basic error limit voltage ranges	+/-0.2%	-	+/-0.2%	+/-0.2%
Destruction limit against external applied voltage	-	-	-	-
Current outputs	-	✓	-	-
Max. in load resistance (current range)	-	350 Ω	-	-
Max. inductive load (current range)	-	10 mH	-	-
Max. inductive load (current range)	-	12 V	-	-
Output current ranges	-	0 mA ... +20 mA +4 mA ... +20 mA	-	-
Operational limit of current ranges	-	+/-0.4% ... +/-0.5%	-	-
Basic error limit current ranges	-	+/-0.2% ... +/-0.3%	-	-
Destruction limit against external applied voltage	-	-	-	-
Settling time for ohmic load	1.5 ms	0.25 ms	1.5 ms	1.5 ms
Settling time for capacitive load	2 ms	-	2 ms	2 ms
Settling time for inductive load	-	1.5 ms	-	-
Resolution in bit	12	12	12	12

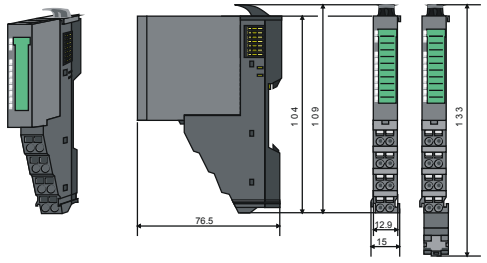
Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

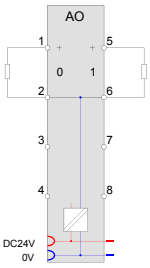
Order number	032-1BB30	032-1BB40	032-1BB70	032-1BD30
Conversion time	2 ms all channels	2 ms all channels	2 ms all channels	2 ms all channels
Substitute value can be applied	no	no	no	no
Output data size	4 Byte	4 Byte	4 Byte	8 Byte
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	yes	yes	yes	yes
Diagnostics information read-out	possible	possible	possible	possible
Supply voltage display	green LED	green LED	green LED	green LED
Group error display	red LED	red LED	red LED	red LED
Channel error display	red LED per channel	red LED per channel	red LED per channel	red LED per channel
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	✓	✓	✓	✓
Max. potential difference between circuits	-	-	-	-
Max. potential difference between inputs (Ucm)	-	-	-	-
Max. potential difference between Mana and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between inputs and Mana (Ucm)	-	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	-	-	-	-
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	0	0	0	0
Output bytes	4	4	4	8
Parameter bytes	8	8	8	10
Diagnostic bytes	20	20	20	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

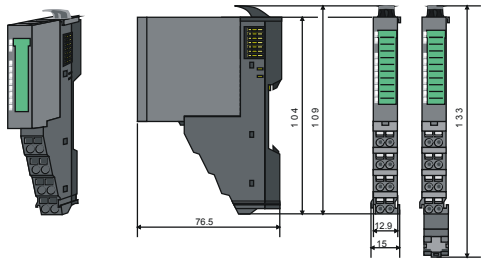
Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

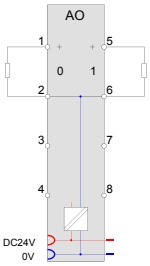
032-1BB30



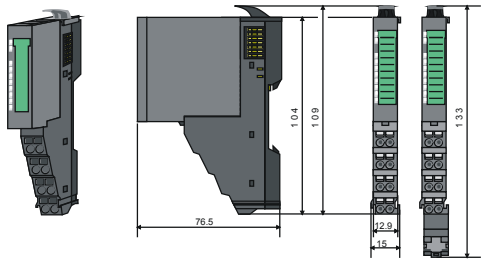


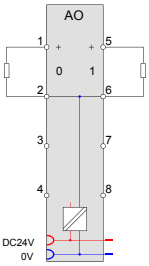
032-1BB40



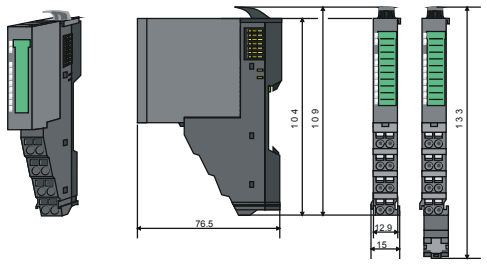


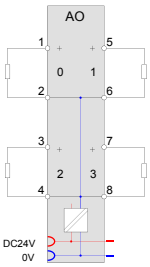
032-1BB70





032-1BD30





Analog output modules

Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

Order number	032-1BD40	032-1BD70	032-1CB30	032-1CB70
Figure				
Type	SM 032	SM 032	SM 032	SM 032
Module ID	0504 25E0	0506 25E0	0507 2558	0508 2558
General information				
Note	-	-	-	-
Features	› 4 outputs 12Bit › Current 0(4)...20mA	› 4 outputs 12Bit › Voltage -10 V...+10 V	› 2 outputs 16Bit › Voltage 0...10 V	› 2 outputs 16Bit › Voltage -10 V...+10 V
Current consumption/power loss				
Current consumption from backplane bus	80 mA	60 mA	60 mA	60 mA
Power loss	0.8 W	0.8 W	0.8 W	0.8 W
Technical data analog outputs				
Number of outputs	4	4	2	2
Cable length, shielded	200 m	200 m	200 m	200 m
Rated load voltage	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Reverse polarity protection of rated load voltage	✓	✓	✓	✓
Current consumption from load voltage L+ (without load)	-	-	-	-
Voltage output short-circuit protection	-	✓	✓	✓
Voltage outputs	-	✓	✓	✓
Min. load resistance (voltage range)	-	5 kΩ	5 kΩ	5 kΩ
Max. capacitive load (current range)	-	1 µF	1 µF	1 µF
Max. inductive load (current range)	-	10 mA	10 mA	10 mA
Output voltage ranges	-	-10 V ... +10 V	0 V ... +10 V	-10 V ... +10 V
Operational limit of voltage ranges	-	+/-0.3%	+/-0.2%	+/-0.2%
Basic error limit voltage ranges	-	+/-0.2%	+/-0.1%	+/-0.1%
Destruction limit against external applied voltage	-	-	-	-
Current outputs	✓	-	-	-
Max. in load resistance (current range)	350 Ω	-	-	-
Max. inductive load (current range)	10 mH	-	-	-
Max. inductive load (current range)	12 V	-	-	-
Output current ranges	0 mA ... +20 mA +4 mA ... +20 mA	-	-	-
Operational limit of current ranges	+/-0.4% ... +/-0.5%	-	-	-
Basic error limit current ranges	+/-0.2% ... +/-0.3%	-	-	-
Destruction limit against external applied voltage	-	-	-	-
Settling time for ohmic load	0.25 ms	1.5 ms	150 µs	150 µs
Settling time for capacitive load	-	2 ms	1 ms	1 ms
Settling time for inductive load	1.5 ms	-	-	-
Resolution in bit	12	12	16	16

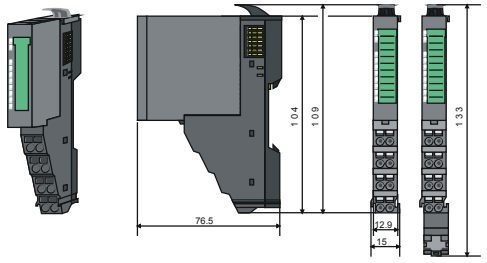
Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

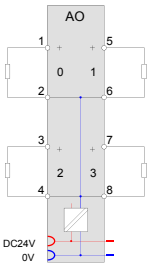
Order number	032-1BD40	032-1BD70	032-1CB30	032-1CB70
Conversion time	2 ms all channels	2 ms all channels	200 µs all channels	200 µs all channels
Substitute value can be applied	no	no	no	no
Output data size	8 Byte	8 Byte	4 Byte	4 Byte
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	no	no	no	no
Process alarm	no	no	no	no
Diagnostic interrupt	no	no	no	no
Diagnostic functions	yes	yes	yes	yes
Diagnostics information read-out	possible	possible	possible	possible
Supply voltage display	green LED	green LED	green LED	green LED
Group error display	red LED	red LED	red LED	red LED
Channel error display	red LED per channel	red LED per channel	red LED per channel	red LED per channel
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	✓	✓	✓	✓
Max. potential difference between circuits	-	-	-	-
Max. potential difference between inputs (Ucm)	-	-	-	-
Max. potential difference between Mana and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V
Max. potential difference between inputs and Mana (Ucm)	-	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	-	-	-	-
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	0	0	0	0
Output bytes	8	8	4	4
Parameter bytes	10	10	8	8
Diagnostic bytes	20	20	20	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

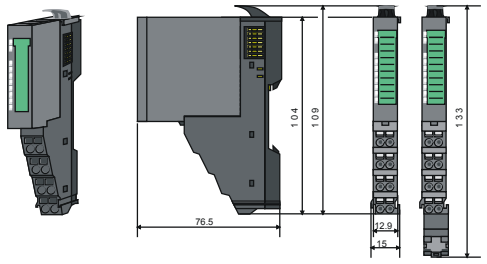
Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

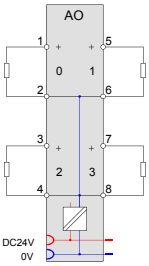
032-1BD40





032-1BD70





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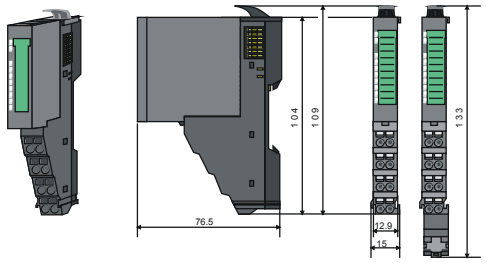

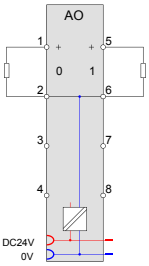

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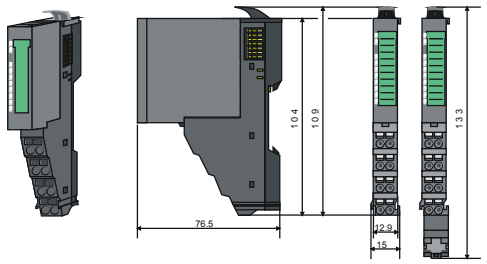
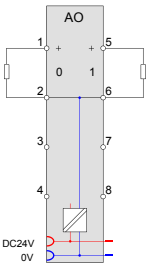




Analog output modules

Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

Order number	032-1CD30	032-1CD70		
Figure				
Type	SM 032	SM 032		
Module ID	0509 2560	050A 2560		
General information				
Note	-	-		
Features	› 4 outputs 16Bit › Voltage 0...10 V	› 4 outputs 16Bit › Voltage -10 V...+10 V		
Current consumption/power loss				
Current consumption from backplane bus	60 mA	60 mA		
Power loss	0.8 W	0.8 W		
Technical data analog outputs				
Number of outputs	4	4		
Cable length, shielded	200 m	200 m		
Rated load voltage	DC 24 V	DC 24 V		
Reverse polarity protection of rated load voltage	✓	✓		
Current consumption from load voltage L+ (without load)	-	-		
Voltage output short-circuit protection	✓	✓		
Voltage outputs	✓	✓		
Min. load resistance (voltage range)	5 kΩ	5 kΩ		
Max. capacitive load (current range)	1 µF	1 µF		
Max. inductive load (current range)	10 mA	10 mA		
Output voltage ranges	0 V ... +10 V	-10 V ... +10 V		
Operational limit of voltage ranges	+/-0.2%	+/-0.2%		
Basic error limit voltage ranges	+/-0.1%	+/-0.1%		
Destruction limit against external applied voltage	-	-		
Current outputs	-	-		
Max. in load resistance (current range)	-	-		
Max. inductive load (current range)	-	-		
Max. inductive load (current range)	-	-		
Output current ranges	-	-		
Operational limit of current ranges	-	-		
Basic error limit current ranges	-	-		
Destruction limit against external applied voltage	-	-		
Settling time for ohmic load	150 µs	150 µs		
Settling time for capacitive load	1 ms	2 ms		
Settling time for inductive load	-	-		
Resolution in bit	16	16		
Conversion time	200 µs all channels	200 µs all channels		

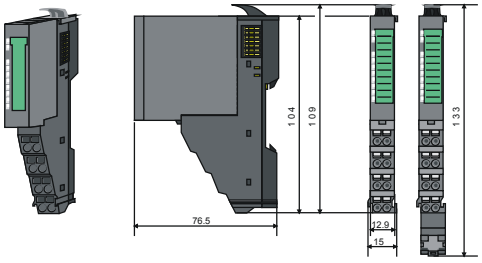
Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

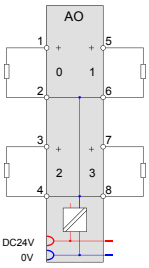
Order number	032-1CD30	032-1CD70		
Substitute value can be applied	no	no		
Output data size	8 Byte	8 Byte		
Status information, alarms, diagnostics				
Status display	yes	yes		
Interrupts	no	no		
Process alarm	no	no		
Diagnostic interrupt	no	no		
Diagnostic functions	yes	yes		
Diagnostics information read-out	possible	possible		
Supply voltage display	green LED	green LED		
Group error display	red LED	red LED		
Channel error display	red LED per channel	red LED per channel		
Isolation				
Between channels	-	-		
Between channels of groups to	-	-		
Between channels and backplane bus	✓	✓		
Between channels and power supply	✓	✓		
Max. potential difference between circuits	-	-		
Max. potential difference between inputs (Ucm)	-	-		
Max. potential difference between Mana and Mintern (Uiso)	DC 75 V/ AC 60 V	DC 75 V/ AC 60 V		
Max. potential difference between inputs and Mana (Ucm)	-	-		
Max. potential difference between inputs and Mintern (Uiso)	-	-		
Max. potential difference between Mintern and outputs	-	-		
Insulation tested with	DC 500 V	DC 500 V		
Datasizes				
Input bytes	0	0		
Output bytes	8	8		
Parameter bytes	10	10		
Diagnostic bytes	20	20		
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm		
Weight	60 g	60 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

Connections, Interfaces

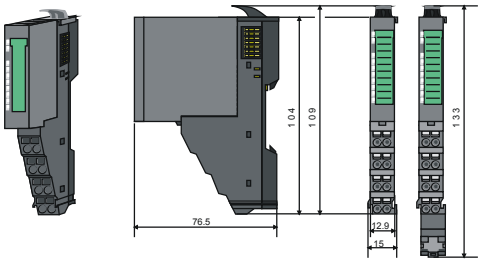
Signal modules analog | Analog output modules						
032-1BB30 032-1BB40 032-1BB70 032-1BD30	032-1BD40 032-1BD70 032-1CB30 032-1CB70	032-1CD30 032-1CD70				

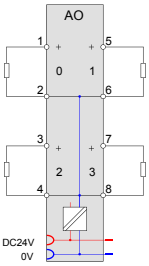
032-1CD30

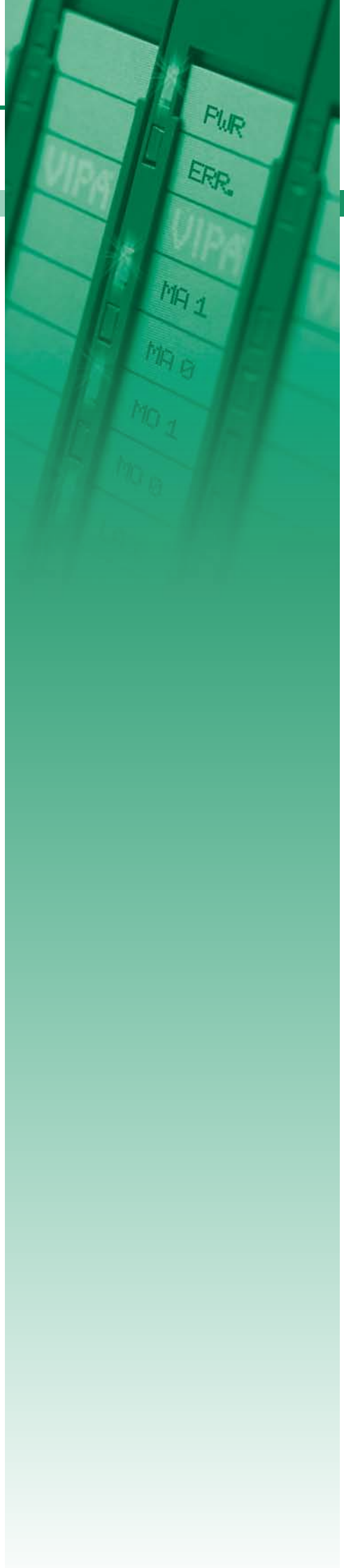




032-1CD70







Communication processors

Structure and Function

Communications processors are used to connect different target and source systems, e.g. via Ethernet to higher-level ERP systems or serially to scanners, printers and other peripherals.

CP 040

The communication processors CP 040 enable the serial process coupling to different target and source systems. Depending on the module they have a RS232 or a RS422/485 interface.

Characteristics

- Support for all standard protocols ASCII, STX/ETX, 3964(R) and Modbus (master, slave)
- Internal communication via VIPA FBs
- Compact design
- LED status indicator
- Electrically isolated to the backplane bus
- Assembly with 35 mm profile rail
- 24 month warranty

Overview

Order no.	Name/Description	Page
RS232/422/485 and other CPs		
040-1BA00	**CP 040 - Communication processor** › RS232 interface	**110**
040-1CA00	**CP 040 - Communication processor** › RS422/485 interface	**110**

RS232/422/485 and other CPs

Communication processors | RS232/422/485 and other CPs						
040-1BA00 040-1CA00						

Order number	040-1BA00	040-1CA00		
Figure				
Type	CP 040 RS232	CP 040 RS422/485		
Module ID	0E01 0700	0E41 1700		
General information				
Note	-	-		
Features	› RS232 interface	› RS422/485 interface		
Current consumption/power loss				
Current consumption from backplane bus	100 mA	100 mA		
Current consumption from load voltage L+ (without load)	10 mA	10 mA		
Power loss	1 W	1 W		
Status information, alarms, diagnostics				
Status display	yes	yes		
Interrupts	yes, parameterizable	yes, parameterizable		
Process alarm	no	no		
Diagnostic interrupt	yes, parameterizable	yes, parameterizable		
Diagnostic functions	yes, parameterizable	yes, parameterizable		
Diagnostics information read-out	possible	possible		
Supply voltage display	green LED	green LED		
Group error display	red LED	red LED		
Channel error display	red LED	red LED		
Point-to-point communication				
PtP communication	✓	✓		
Interface isolated	✓	✓		
RS232 interface	✓	-		
RS422 interface	-	✓		
RS485 interface	-	✓		
Connector	Terminal module	Terminal module		
Transmission speed, min.	150 bit/s	150 bit/s		
Transmission speed, max.	115.2 kbit/s	115.2 kbit/s		
Cable length, max.	15 m	1200 m		
Point-to-point protocol				
ASCII protocol	✓	✓		
STX/ETX protocol	✓	✓		
3964(R) protocol	✓	✓		
RK512 protocol	-	-		
USS master protocol	-	-		
Modbus master protocol	✓	✓		
Modbus slave protocol	✓	✓		
Special protocols	-	-		

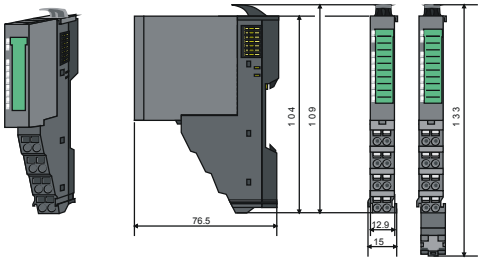
Communication processors | RS232/422/485 and other CPs						
040-1BA00 040-1CA00						

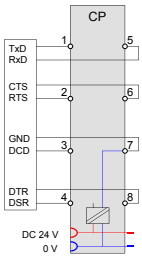
Order number	040-1BA00	040-1CA00		
Datasizes				
Input bytes	8 / 20 / 60	8 / 20 / 60		
Output bytes	8 / 20 / 60	8 / 20 / 60		
Parameter bytes	21	23		
Diagnostic bytes	20	20		
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10		
Mounting	Profile rail 35 mm	Profile rail 35 mm		
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm		
Weight	60 g	60 g		
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C		
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C		
Certifications				
UL508 certification	yes	yes		

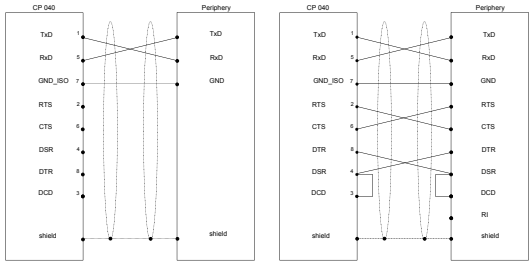
Connections, Interfaces

Communication processors | RS232/422/485 and other CPs						
040-1BA00 040-1CA00						

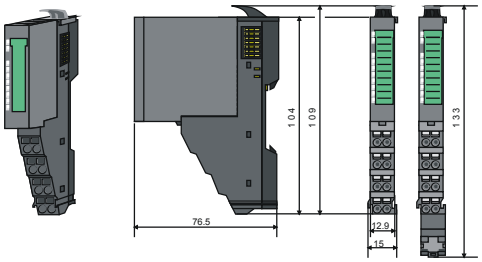
040-1BA00

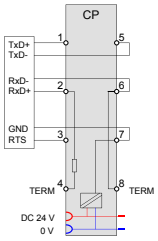


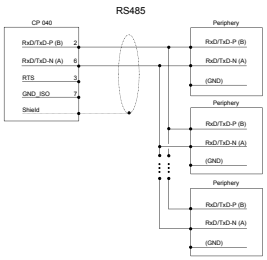


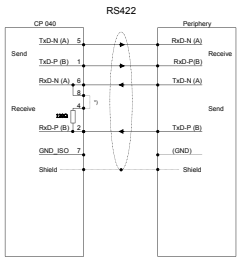


040-1CA00









Function modules

Structure and Function

Function modules (FM) are intelligent modules that perform technological tasks such as position determination, counting and positioning, and other complex functions in the automation independently. They are used when there are high demands on accuracy and dynamic in the starting of automation tasks.

Different functional modules, for example counter modules, SSI modules provide exactly the functions that are required for the respective tasks.

Each functional module consists of a terminal and an electronic module.

The terminal module (TM) contains the retainer for the electronic module (EM), the backplane connectors and contacts for the distribution of the load power supply electronics, the modular connection to DC 24 V load power supply and the staircase-shaped terminal block for the wiring.

Furthermore the terminal module processes a locking system for fixing to a profile rail. The SLIO system can also be constructed "block by block" outside the cabinet and later assembled as a complete system in the control cabinet.

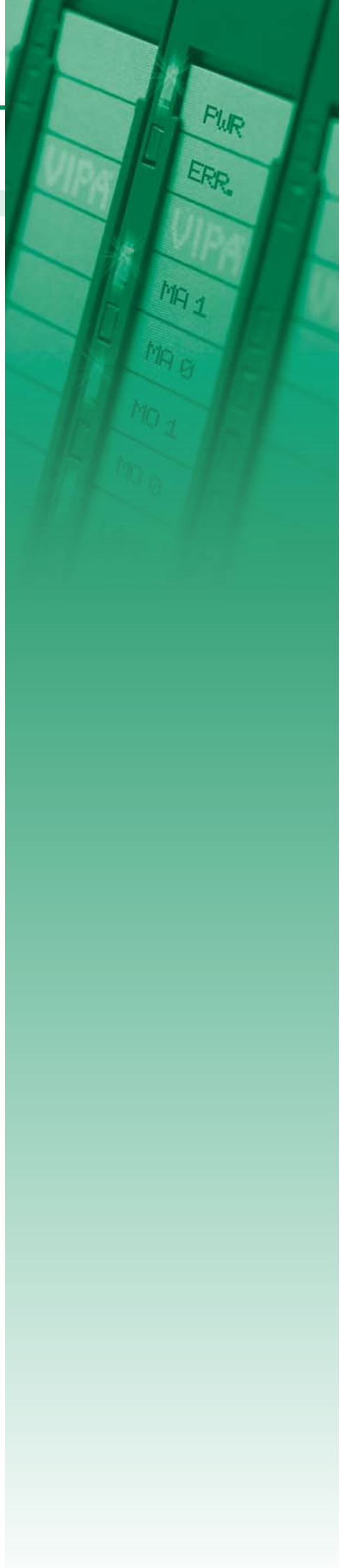
The functionality of the signal module is defined via the electronic module that is connected by a secure sliding mechanism to the terminal module.

During service the defective electronic module can be replaced without detaching the wiring.

Characteristics

- Supports fast counter systems up to 1 MHz
- Counting direction invertible
- Integrated digital outputs
- For direct connection of incremental encoders
- Electrically isolated to the backplane bus
- Direct mapping and readability of the channel conditions via status LEDs
- Safe and time-saving installation by the terminal assignment mounted on the module
- When changing the module equipment identification (BMK) is retained on the TM
- Individual single-channel lettering on insertion strip
- 24 month warranty

Overview



Order no.	Name/Description	Page
Counter modules		
050-1BA00	**FM 050 - Counter module** › 1 Counter 32 Bit (AB) › DC 24 V	**116**
050-1BA10	**FM 050 - Counter module** › 1 Counter 32 Bit (AB) › DC 5 V (difference signal)	**116**
050-1BB00	**FM 050 - Counter module** › 2 Counter 32 Bit (AB) › DC 24 V	**116**
050-1BB30	**FM 050 - Counter module Eco** › 2 Counter 32 Bit (AB) › DC 24 V	**116**
050-1BB40	**FM 050 - Frequency measurement** › 2 channels 24 Bit › DC 24 V	**120**
SSI modules		
050-1BS00	**FM 050S - SSI module** › SSI - Encoder › Master or slave mode › Encoder frequency 125 kHz...2 MHz › µs time stamp for encoder value	**124**

Counter modules

Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

Order number	050-1BA00	050-1BA10	050-1BB00	050-1BB30
Figure				
Type	FM 050	FM 050	FM 050	FM 050
Module ID	08C1 3800	08C2 3801	08C3 380A	08C4 388B
General information				
Note	-	-	-	-
Features	› 1 Counter 32 Bit (AB) › DC 24 V	› 1 Counter 32 Bit (AB) › DC 5 V (difference signal)	› 2 Counter 32 Bit (AB) › DC 24 V	› 2 Counter 32 Bit (AB) › DC 24 V
Current consumption/power loss				
Current consumption from backplane bus	75 mA	70 mA	75 mA	75 mA
Power loss	1 W	0.85 W	0.9 W	0.9 W
Technical data digital inputs				
Number of inputs	5	-	4	4
Cable length, shielded	100 m	100 m	100 m	100 m
Cable length, unshielded	-	-	-	-
Rated load voltage	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Reverse polarity protection of rated load voltage	-	-	-	-
Current consumption from load voltage L+ (without load)	20 mA	20 mA	15 mA	15 mA
Rated value	DC 20.4...28.8 V	-	DC 20.4...28.8 V	DC 20.4...28.8 V
Input voltage for signal "0"	DC 0...5 V	Differential signal RS422	DC 0...5 V	DC 0...5 V
Input voltage for signal "1"	DC 15...28.8 V	Differential signal RS422	DC 15...28.8 V	DC 15...28.8 V
Input voltage hysteresis	-	-	-	-
Frequency range	-	-	-	-
Input resistance	-	120 Ω	-	-
Input current for signal "1"	3 mA	-	3 mA	3 mA
Connection of Two-Wire-BEROs possible	✓	-	✓	✓
Max. permissible BERO quiescent current	0.5 mA	-	0.5 mA	0.5 mA
Input delay of "0" to "1"	0.8 µs	0.8 µs	0.8 µs	0.8 µs
Input delay of "1" to "0"	0.8 µs	0.8 µs	0.8 µs	0.8 µs
Number of simultaneously utilizable inputs horizontal configuration	5	-	4	4
Number of simultaneously utilizable inputs vertical configuration	5	-	4	4
Input characteristic curve	IEC 61131-2, type 1	-	IEC 61131-2, type 1	IEC 61131-2, type 1
Initial data size	12 Byte	8 Byte	12 Byte	12 Byte
Technical data digital outputs				
Number of outputs	1	-	-	-
Cable length, shielded	100 m	-	-	-
Cable length, unshielded	100 m	-	-	-
Rated load voltage	DC 20.4...28.8 V	-	-	-

Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

Order number	050-1BA00	050-1BA10	050-1BB00	050-1BB30
Current consumption from load voltage L+ (without load)	-	-	-	-
Output delay of "0" to "1"	30 µs	-	-	-
Output delay of "1" to "0"	30 µs	-	-	-
Minimum load current	-	-	-	-
Lamp load	10 W	-	-	-
Parallel switching of outputs for redundant control of a load	not possible	-	-	-
Parallel switching of outputs for increased power	not possible	-	-	-
Actuation of digital input	✓	-	-	-
Switching frequency with resistive load	max. 10 kHz	-	-	-
Switching frequency with inductive load	max. 0.5 Hz	-	-	-
Switching frequency on lamp load	max. 10 kHz	-	-	-
Internal limitation of inductive shut-off voltage	L+ (-52 V)	-	-	-
Short-circuit protection of output	yes, electronic	-	-	-
Trigger level	1 A	-	-	-
Number of operating cycle of relay outputs	-	-	-	-
Switching capacity of contacts	-	-	-	-
Output data size	10 Byte	10 Byte	12 Byte	4 Byte
Technical data counters				
Number of counters	1	1	2	2
Counter width	32 Bit	32 Bit	32 Bit	32 Bit
Maximum input frequency	100 kHz	500 kHz	100 kHz	100 kHz
Maximum count frequency	400 kHz	2 MHz	400 kHz	400 kHz
Mode incremental encoder	✓	✓	✓	✓
Mode pulse / direction	✓	✓	✓	✓
Mode pulse	-	-	-	-
Mode frequency counter	-	-	-	-
Mode period measurement	-	-	-	-
Gate input available	✓	-	-	-
Latch input available	✓	-	-	-
Reset input available	✓	✓	-	-
Counter output available	✓	-	-	-
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	yes, parameterizable	yes, parameterizable	yes, parameterizable	no
Process alarm	yes, parameterizable	yes, parameterizable	yes, parameterizable	no
Diagnostic interrupt	yes, parameterizable	yes, parameterizable	yes, parameterizable	no
Diagnostic functions	yes, parameterizable	yes, parameterizable	yes, parameterizable	no
Diagnostics information read-out	possible	possible	possible	possible
Module state	green LED	green LED	green LED	green LED
Module error display	red LED	red LED	red LED	red LED
Channel error display	none	none	none	none

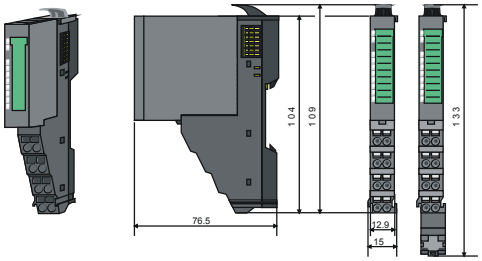
Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

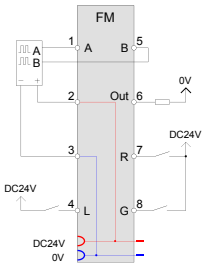
Order number	050-1BA00	050-1BA10	050-1BB00	050-1BB30
Isolation				
Between channels	-	-	-	-
Between channels of groups to	-	-	-	-
Between channels and backplane bus	✓	✓	✓	✓
Between channels and power supply	-	-	-	-
Max. potential difference between circuits	-	-	-	-
Max. potential difference between inputs (Ucm)	-	-	-	-
Max. potential difference between Mana and Mintern (Uiso)	-	-	-	-
Max. potential difference between inputs and Mana (Ucm)	-	-	-	-
Max. potential difference between inputs and Mintern (Uiso)	-	-	-	-
Max. potential difference between Mintern and outputs	-	-	-	-
Insulation tested with	DC 500 V	DC 500 V	DC 500 V	DC 500 V
Datasizes				
Input bytes	12	8	12	12
Output bytes	10	10	12	4
Parameter bytes	25	23	45	12
Diagnostic bytes	20	20	20	20
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm	12.9 mm x 109 mm x 76.5 mm
Weight	60 g	60 g	60 g	60 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

Connections, Interfaces

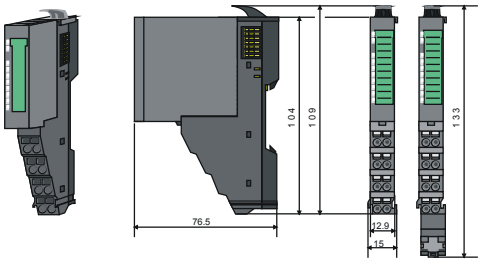
Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

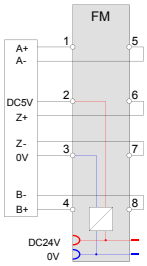
050-1BA00



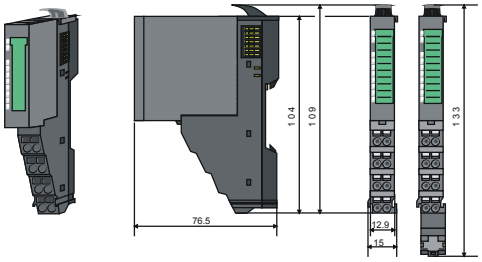


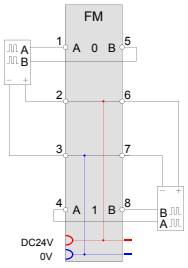
050-1BA10



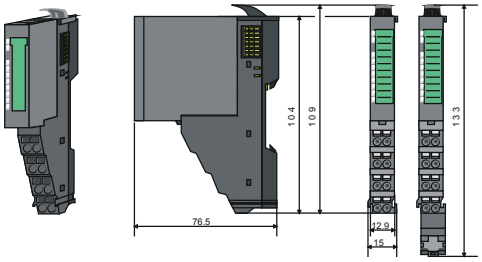


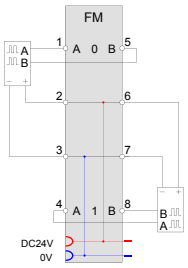
050-1BB00





050-1BB30





Counter modules

Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

Order number	050-1BB40			
Figure				
Type	FM 050			
Module ID	0881 2880			
General information				
Note	-			
Features	› 2 channels 24 Bit › DC 24 V			
Current consumption/power loss				
Current consumption from backplane bus	35 mA			
Power loss	0.5 W			
Technical data digital inputs				
Number of inputs	2			
Cable length, shielded	100 m			
Cable length, unshielded	-			
Rated load voltage	DC 20.4...28.8 V			
Reverse polarity protection of rated load voltage	-			
Current consumption from load voltage L+ (without load)	5 mA			
Rated value	DC 20.4...28.8 V			
Input voltage for signal "0"	DC 0...5 V			
Input voltage for signal "1"	DC 15...28.8 V			
Input voltage hysteresis	-			
Frequency range	-			
Input resistance	-			
Input current for signal "1"	3 mA			
Connection of Two-Wire-BEROs possible	✓			
Max. permissible BERO quiescent current	0.5 mA			
Input delay of "0" to "1"	0.8 µs			
Input delay of "1" to "0"	0.8 µs			
Number of simultaneously utilizable inputs horizontal configuration	2			
Number of simultaneously utilizable inputs vertical configuration	2			
Input characteristic curve	IEC 61131-2, type 1			
Initial data size	20 Byte			
Technical data digital outputs				
Number of outputs	-			
Cable length, shielded	-			
Cable length, unshielded	-			
Rated load voltage	-			

Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

Order number	050-1BB40			
Current consumption from load voltage L+ (without load)	-			
Output delay of "0" to "1"	-			
Output delay of "1" to "0"	-			
Minimum load current	-			
Lamp load	-			
Parallel switching of outputs for redundant control of a load	-			
Parallel switching of outputs for increased power	-			
Actuation of digital input	-			
Switching frequency with resistive load	-			
Switching frequency with inductive load	-			
Switching frequency on lamp load	-			
Internal limitation of inductive shut-off voltage	-			
Short-circuit protection of output	-			
Trigger level	-			
Number of operating cycle of relay outputs	-			
Switching capacity of contacts	-			
Output data size	12 Byte			
Technical data counters				
Number of counters	2			
Counter width	24 Bit			
Maximum input frequency	600 kHz			
Maximum count frequency	600 kHz			
Mode incremental encoder	-			
Mode pulse / direction	-			
Mode pulse	-			
Mode frequency counter	✓			
Mode period measurement	✓			
Gate input available	-			
Latch input available	-			
Reset input available	-			
Counter output available	-			
Status information, alarms, diagnostics				
Status display	yes			
Interrupts	no			
Process alarm	no			
Diagnostic interrupt	no			
Diagnostic functions	no			
Diagnostics information read-out	possible			
Module state	green LED			
Module error display	red LED			
Channel error display	none			

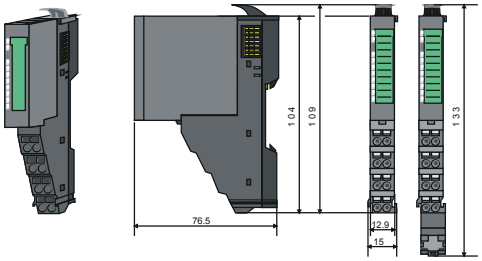
Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

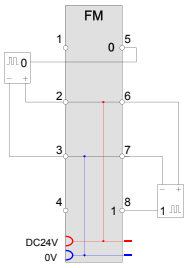
Order number	050-1BB40			
Isolation				
Between channels	-			
Between channels of groups to	-			
Between channels and backplane bus	✓			
Between channels and power supply	-			
Max. potential difference between circuits	-			
Max. potential difference between inputs (Ucm)	-			
Max. potential difference between Mana and Mintern (Uiso)	-			
Max. potential difference between inputs and Mana (Ucm)	-			
Max. potential difference between inputs and Mintern (Uiso)	-			
Max. potential difference between Mintern and outputs	-			
Insulation tested with	DC 500 V			
Datasizes				
Input bytes	20			
Output bytes	12			
Parameter bytes	8			
Diagnostic bytes	20			
Housing				
Material	PPE / PPE GF10			
Mounting	Profile rail 35 mm			
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm			
Weight	60 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	in preparation			

Connections, Interfaces

Function modules | Counter modules						
050-1BA00 050-1BA10 050-1BB00 050-1BB30	050-1BB40					

050-1BB40





SSI modules

Function modules | SSI modules						
050-1BS00						

Order number	050-1BS00			
Figure				
Type	FM 050			
Module ID	09C1 7800			
General information				
Note	-			
Features	› SSI - Encoder › Master or slave mode › Encoder frequency 125 kHz...2 MHz › µs time stamp for encoder value			
Current consumption/power loss				
Current consumption from backplane bus	70 mA			
Power loss	1 W			
Parallel switching of outputs for increased power	-			
Status information, alarms, diagnostics				
Status display	yes			
Interrupts	yes, parameterizable			
Process alarm	no			
Diagnostic interrupt	yes, parameterizable			
Diagnostic functions	yes, parameterizable			
Diagnostics information read-out	possible			
Module state	green LED			
Module error display	red LED			
Channel error display	none			
Isolation				
Between channels	-			
Between channels of groups to	-			
Between channels and backplane bus	✓			
Between channels and power supply	-			
Max. potential difference between circuits	-			
Max. potential difference between inputs (Ucm)	-			
Max. potential difference between Mana and Mintern (Uiso)	-			
Max. potential difference between inputs and Mana (Ucm)	-			
Max. potential difference between inputs and Mintern (Uiso)	-			
Max. potential difference between Mintern and outputs	-			
Insulation tested with	DC 500 V			

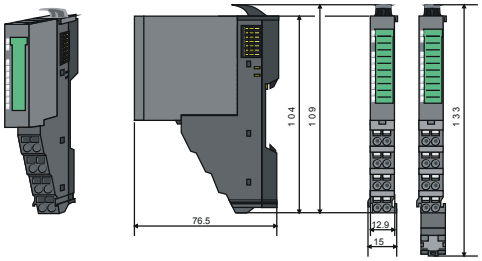
Function modules | SSI modules						
050-1BS00						

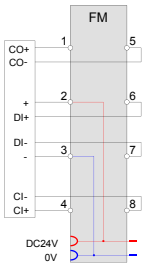
Order number	050-1BS00			
Datasizes				
Input bytes	6			
Output bytes	0			
Parameter bytes	17			
Diagnostic bytes	20			
Housing				
Material	PPE / PPE GF10			
Mounting	Profile rail 35 mm			
Mechanical data				
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm			
Weight	60 g			
Environmental conditions				
Operating temperature	0 °C to 60 °C			
Storage temperature	-25 °C to 70 °C			
Certifications				
UL508 certification	yes			

Connections, Interfaces

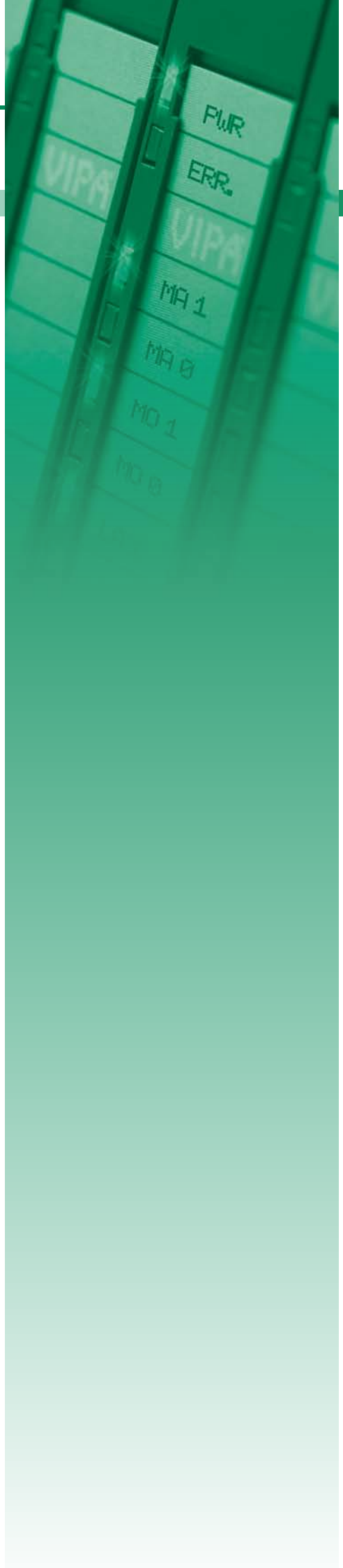
Function modules | SSI modules						
050-1BS00						

050-1BS00





Interface modules



Structure and Function

Interface modules (IM) form the interface between process level and parent bus system. All control signals are transmitted through the internal backplane bus to the electronics module (EM).

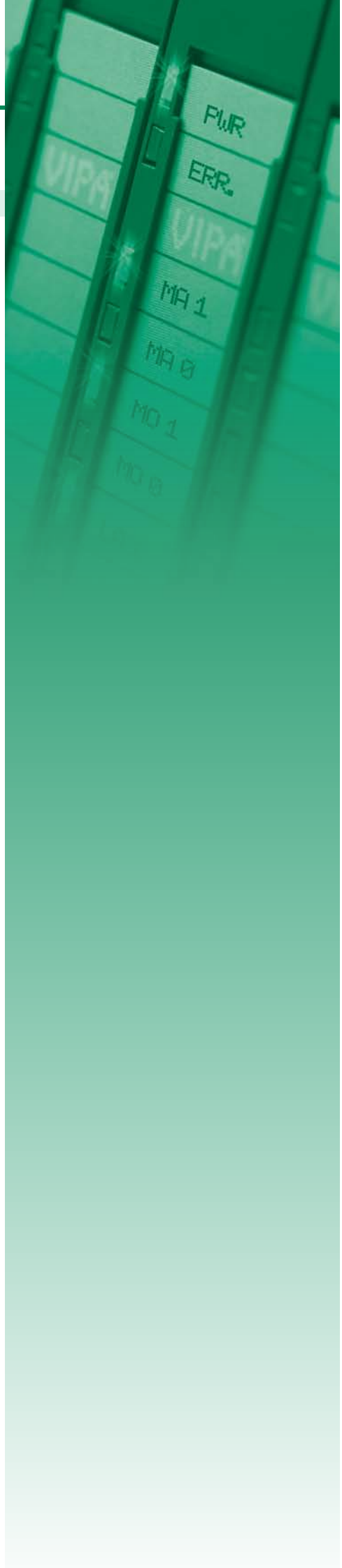
In the case of the interface module the bus interface and power module (PM) are integrated in a single casing. Both the bus interface and the electronics of the connected peripheral modules are supplied with power via the integrated power module.

Up to 64 I/O modules can be operated on the interface module.

Characteristics

- Support for various fieldbus systems
- Functional DIP switches for address setting for the PROFIBUS-DP and CANopen with transparent cover
- MAC address on the front in plain text
- Electrical isolation between fieldbus and input/output field
- Integrated DC 24 V power module to the electronic and load voltage supply of the peripheral modules
- Easy to maintain, replaceable power module
- Up to 64 signal and function modules per interface module
- 24 month warranty

Overview



Order no.	Name/Description	Page
Fieldbus slave modules without I/Os		
053-1CA00	**IM 053CAN - CANopen slave** › CANopen slave › 16 Rx and 16 Tx PDOs › 2 SDOs › PDO linking › PDO mapping: fix › up to 64 peripheral modules	**130**
053-1DN00	**IM 053DN - DeviceNet slave** › DeviceNet slave › Group 2 only device › Poll only device › Baud rate: 125, 250 and 500kbit/s › up to 64 peripheral modules	**130**
053-1DP00	**IM 053DP - PROFIBUS-DP slave** › PROFIBUS-DP slave (DP-V0, DP-V1) › 244 Byte input and 244 Byte output data › up to 64 peripheral modules	**130**
053-1EC00	**IM 053EC - EtherCAT slave** › EtherCAT slave › RJ45 jack 100BaseTX › up to 64 peripheral modules	**130**
053-1IP00	**IM 053IP - EtherNet/IP slave** › EtherNet/IP-Slave › I/O configuration via fieldbus › up to 64 peripheral modules	**133**
053-1MT00	**IM 053MT - Modbus/TCP slave** › Modbus/TCP slave › I/O configuration via fieldbus › up to 64 peripheral modules	**133**
053-1PN00	**IM 053PN - PROFINET-IO slave** › PROFINET-IO slave › Transfer rate 100Mbit/s › up to 64 peripheral modules	**133**

Fieldbus slave modules without I/Os

Interface modules | Fieldbus slave modules without I/Os						
053-1CA00 053-1DN00 053-1DP00 053-1EC00	053-1IP00 053-1MT00 053-1PN00					

Order number	053-1CA00	053-1DN00	053-1DP00	053-1EC00
Figure				
Type	IM 053CAN	IM 053DN	IM 053DP	IM 053EC
Module ID	-	-	-	-
General information				
Note	-	-	-	-
Features	› CANopen slave › 16 Rx and 16 Tx PDOs › 2 SDOs › PDO linking › PDO mapping: fix › up to 64 peripheral modules	› DeviceNet slave › Group 2 only device › Poll only device › Baud rate: 125, 250 and 500kbit/s › up to 64 peripheral modules	› PROFIBUS-DP slave (DP-V0, DP-V1) › 244 Byte input and 244 Byte output data › up to 64 peripheral modules	› EtherCAT slave › RJ45 jack 100BaseTX › up to 64 peripheral modules
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V
Reverse polarity protection	✓	✓	✓	✓
Current consumption (no-load operation)	90 mA	90 mA	90 mA	95 mA
Current consumption (rated value)	0.95 A	0.95 A	0.95 A	0.95 A
Inrush current	3.9 A	3.9 A	3.9 A	3.9 A
I^2t	0.14 A^2s	0.14 A^2s	0.14 A^2s	0.14 A^2s
Max. current drain at backplane bus	3 A	3 A	3 A	3 A
Max. current drain load supply	10 A	10 A	10 A	10 A
Power loss	3 W	3 W	3 W	3 W
Status information, alarms, diagnostics				
Status display	yes	yes	yes	yes
Interrupts	yes, parameterizable	-	yes, parameterizable	yes, parameterizable
Process alarm	no	-	yes, parameterizable	yes, parameterizable
Diagnostic interrupt	yes, parameterizable	-	yes, parameterizable	yes, parameterizable
Diagnostic functions	yes, parameterizable	-	yes, parameterizable	yes, parameterizable
Diagnostics information read-out	possible	possible	possible	possible
Supply voltage display	green LED	green LED	green LED	green LED
Service Indicator	-	-	-	-
Group error display	red LED	red SF LED	red LED	red SF LED
Channel error display	none	none	none	none
Hardware configuration				
Racks, max.	1	1	1	1
Modules per rack, max.	64	64	64	64
Number of digital modules, max.	64	64	64	64
Number of analog modules, max.	64	64	64	64

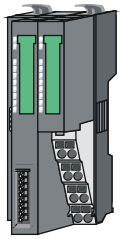
Interface modules | Fieldbus slave modules without I/Os						
053-1CA00 053-1DN00 053-1DP00 053-1EC00	053-1IP00 053-1MT00 053-1PN00					

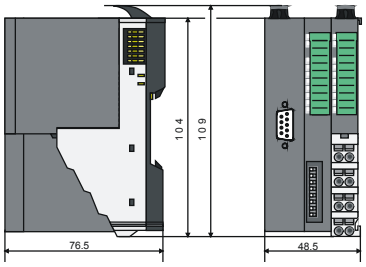
Order number	053-1CA00	053-1DN00	053-1DP00	053-1EC00
Communication				
Fieldbus	CANopen	DeviceNet	PROFIBUS-DP to EN 50170	EtherCAT
Type of interface	CAN	CAN	RS485 isolated	Ethernet 100 MBit
Connector	Sub-D, 9-pin, male	5-pin Open Style Connector	Sub-D, 9-pin, female	2 x RJ45
Topology	Linear bus with bus termination at both ends	Linear bus with bus termination at both ends	Linear bus with bus termination at both ends	-
Electrically isolated	✓	✓	✓	✓
Number of participants, max.	127	64	125	65535
Node addresses	1 - 127	0 - 63	1 - 125	-
Transmission speed, min.	10 kbit/s	125 kbit/s	9.6 kbit/s	100 Mbit/s
Transmission speed, max.	1 Mbit/s	500 kbit/s	12 Mbit/s	100 Mbit/s
Address range inputs, max.	128 Byte	256 Byte	244 Byte	512 Byte
Address range outputs, max.	128 Byte	256 Byte	244 Byte	512 Byte
Number of TxPDOs, max.	16	-	-	-
Number of RxPDOs, max.	16	-	-	-
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm
Mechanical data				
Dimensions (WxHxD)	48.5 mm x 109 mm x 76.5 mm	48.5 mm x 109 mm x 76.5 mm	48.5 mm x 109 mm x 76.5 mm	48.5 mm x 109 mm x 76.5 mm
Weight	155 g	155 g	155 g	155 g
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C
Certifications				
UL508 certification	yes	yes	yes	yes

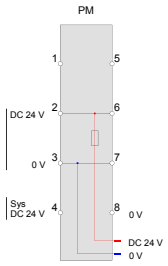
Connections, Interfaces

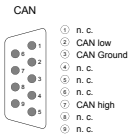
Interface modules | Fieldbus slave modules without I/Os						
053-1CA00 053-1DN00 053-1DP00 053-1EC00	053-1IP00 053-1MT00 053-1PN00					

053-1CA00









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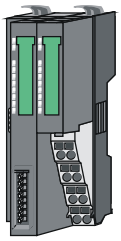

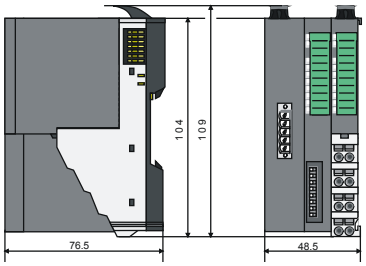

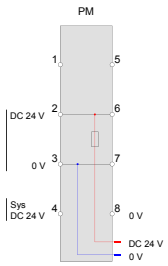

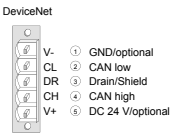

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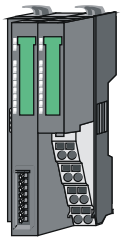

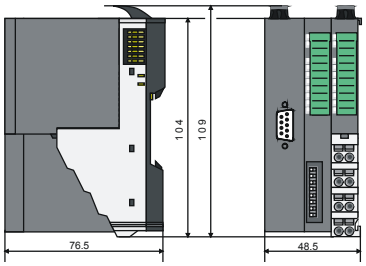

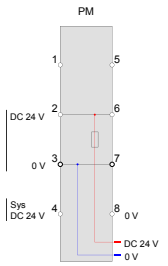

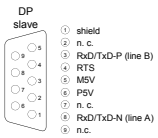

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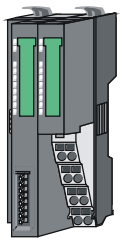
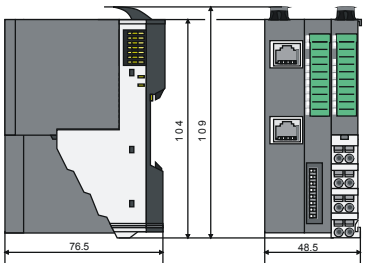
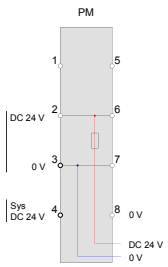
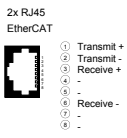








Fieldbus slave modules without I/Os

Interface modules | Fieldbus slave modules without I/Os						
053-1CA00 053-1DN00 053-1DP00 053-1EC00	053-1IP00 053-1MT00 053-1PN00					

Order number	053-1IP00	053-1MT00	053-1PN00	
Figure				
Type	IM 053IP	IM 053MT	IM 053PN	
Module ID	-	-	-	
General information				
Note	-	-	-	
Features	› EtherNet/IP-Slave › I/O configuration via fieldbus › up to 64 peripheral modules	› Modbus/TCP slave › I/O configuration via fieldbus › up to 64 peripheral modules	› PROFINET-IO slave › Transfer rate 100Mbit/s › up to 64 peripheral modules	
Technical data power supply				
Power supply (rated value)	DC 24 V	DC 24 V	DC 24 V	
Power supply (permitted range)	DC 20.4...28.8 V	DC 20.4...28.8 V	DC 20.4...28.8 V	
Reverse polarity protection	✓	✓	✓	
Current consumption (no-load operation)	95 mA	95 mA	95 mA	
Current consumption (rated value)	0.95 A	0.95 A	0.95 A	
Inrush current	3.9 A	3.9 A	3.9 A	
I^2t	0.14 A^2s	0.14 A^2s	0.14 A^2s	
Max. current drain at backplane bus	3 A	3 A	3 A	
Max. current drain load supply	10 A	10 A	10 A	
Power loss	3 W	3 W	3 W	
Status information, alarms, diagnostics				
Status display	yes	yes	yes	
Interrupts	yes, parameterizable	yes, parameterizable	yes, parameterizable	
Process alarm	yes, parameterizable	yes, parameterizable	yes, parameterizable	
Diagnostic interrupt	yes, parameterizable	yes, parameterizable	yes, parameterizable	
Diagnostic functions	yes, parameterizable	yes, parameterizable	yes, parameterizable	
Diagnostics information read-out	possible	possible	possible	
Supply voltage display	green LED	green LED	green LED	
Service Indicator	Bicolour green/red LED	yellow LED	yellow LED	
Group error display	red SF LED	red SF LED	red SF LED	
Channel error display	none	none	none	
Hardware configuration				
Racks, max.	1	1	1	
Modules per rack, max.	64	64	64	
Number of digital modules, max.	64	64	64	
Number of analog modules, max.	64	64	64	
Communication				
Fieldbus	EtherNet/IP	Modbus / TCP/IP	PROFINET-IO	
Type of interface	Ethernet 10/100 MBit	Ethernet 10/100 MBit	Ethernet 100 MBit	
Connector	RJ45	RJ45	2 x RJ45	
Topology	Star topology	-	-	

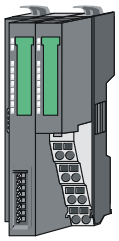
Interface modules | Fieldbus slave modules without I/Os						
053-1CA00 053-1DN00 053-1DP00 053-1EC00	053-1IP00 053-1MT00 053-1PN00					

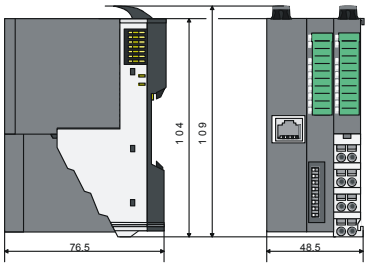
Order number	053-1IP00	053-1MT00	053-1PN00	
Electrically isolated	✓	✓	✓	
Number of participants, max.	-	-	-	
Node addresses	IP V4 address	-	-	
Transmission speed, min.	10 Mbit/s	10 Mbit/s	100 Mbit/s	
Transmission speed, max.	100 Mbit/s	100 Mbit/s	100 Mbit/s	
Address range inputs, max.	1 KB	1 KB	512 Byte	
Address range outputs, max.	1 KB	1 KB	512 Byte	
Number of TxPDOs, max.	-	-	-	
Number of RxPDOs, max.	-	-	-	
Housing				
Material	PPE / PPE GF10	PPE / PPE GF10	PPE / PPE GF10	
Mounting	Profile rail 35 mm	Profile rail 35 mm	Profile rail 35 mm	
Mechanical data				
Dimensions (WxHxD)	48.5 mm x 109 mm x 76.5 mm	48.5 mm x 109 mm x 76.5 mm	48.5 mm x 109 mm x 76.5 mm	
Weight	155 g	155 g	155 g	
Environmental conditions				
Operating temperature	0 °C to 60 °C	0 °C to 60 °C	0 °C to 60 °C	
Storage temperature	-25 °C to 70 °C	-25 °C to 70 °C	-25 °C to 70 °C	
Certifications				
UL508 certification	yes	yes	yes	

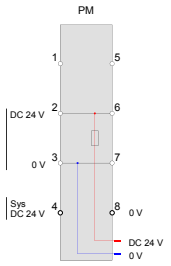
Connections, Interfaces

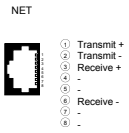
Interface modules | Fieldbus slave modules without I/Os						
053-1CA00 053-1DN00 053-1DP00 053-1EC00	053-1IP00 053-1MT00 053-1PN00					

053-1IP00

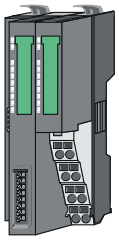


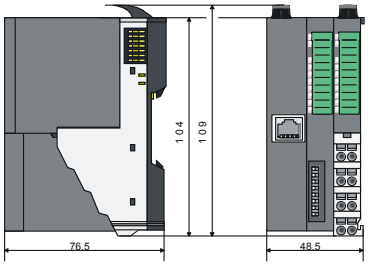


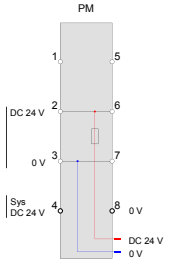


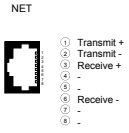


053-1MT00

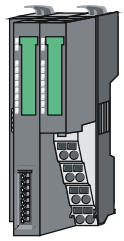


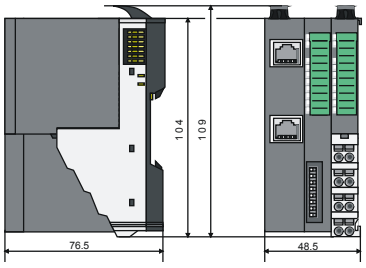


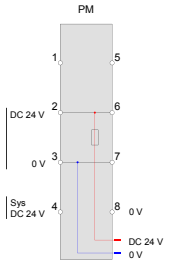


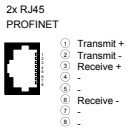


053-1PN00

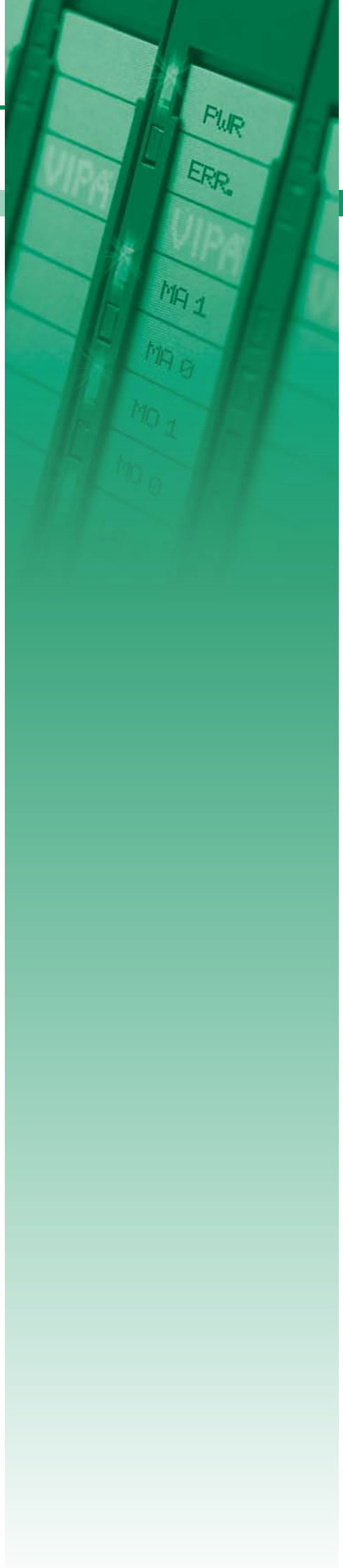








SLIO accessories



Structure and Function

System accessories expand the use of the system and facilitate starting.

35 mm profile rail

Using 35 mm profile rails the respective modules can be mounted directly on the mounting surface. The profile rail is available in various lengths.

Manuals

The technical documentation of the respective modules includes various manuals with the necessary hardware and programming information, detailed descriptions of each module, and instructions for structure and assembly.

35 mm profile rail

Order number	Type	Description	Note
290-1AF00	35 mm profile rail	length 2000 mm	
290-1AF30	35 mm profile rail	length 530 mm	

Miscellaneous

Order number	Type	Description	Note
000-0AA00	SLIO bus cover		
000-0AB00	SLIO shield bus carrier	10 pieces	
000-0AC00	SLIO shield bus carrier	10 pieces	
000-0DN00	SLIO bus cover		

Manuals and operating instructions

Order number	Title	Contents	Language
HB300D_CPU	Manual System SLIO - German	CPU 01x, incl. operations list	DE
HB300E_CPU	Manual System SLIO - German	CPU 01x, incl. operations list	EN
HB300D	Manual System SLIO - German	Manual System SLIO - Compendium, German HB300D_CPU, HB300D_CP, HB300D_SM-DIO, HB300D_SM-AIO, HB300D_IM, HB300D_FM, HB300D_PS-CM	DE
HB300E	Manual System SLIO - English	Manual System SLIO - Compendium, English HB300E_CPU, HB300E_CP, HB300E_SM-DIO, HB300E_SM-AIO, HB300E_IM, HB300E_FM, HB300_PS-CM	EN
HB300D_CP	Manual System SLIO - German	CP - Communication processor	DE
HB300E_CP	Manual System SLIO - English	CP - Communication processor	EN
HB300D_FM	Manual System SLIO - German	FM - Function modules	DE
HB300E_FM	Manual System SLIO - English	FM - Function modules	EN
HB300D_IM	Manual System SLIO - German	IM - Interface modules	DE
HB300E_IM	Manual System SLIO - English	IM - Interface modules	EN
HB300D_PS-CM	Manual System SLIO - German	PS-CM - Power modules / Clamp modules	DE
HB300E_PS-CM	Manual System SLIO - English	PS-CM - Power modules / Clamps modules	EN
HB300D_SM-AIO	Manual System SLIO - German	SM-AIO - Analog Signal modules	DE
HB300E_SM-AIO	Manual System SLIO - English	SM-AIO - Analog Signal modules	EN
HB300D_SM-DIO	Manual System SLIO - German	SM-DIO - Digital Signal modules	DE
HB300E_SM-DIO	Manual System SLIO - English	SM-DIO - Digital Signal modules	EN
HB300D_SM-S	Manual System SLIO - German	SM-DIO - Safety Digital Signal modules	DE
HB300E_SM-S	Manual System SLIO - English	SM-DIO - Safety Digital Signal modules	EN